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CONTENTS

THE AGRICULTURAL SITUATION IN THE UNITED STATES

	PAGE
FOREWORD..... The Editor	V
PART I. THE FARMERS' DOLLAR	
THE FARM INCOME SITUATION..... Robert J. McFall, Massachusetts Agricultural College	1
THE PURCHASING POWER OF THE FARMERS' DOLLAR FROM 1913 TO DATE.... A. B. Genung, New York State College of Agriculture, Cornell University	22
INCOME FROM AGRICULTURAL PRODUCTION..... L. H. Bean and O. C. Stine, Division of Statistical and Historical Research, U. S. Bureau of Agricultural Economics	27
PART II. TAXES, TENANTRY, CREDIT AND FARM OWNERSHIP	
INTEREST AND TAXES IN RELATION TO FARM INCOME..... L. M. Graves, Secretary, Howard-Moorhouse, Inc.	35
TAXES IN RELATION TO EARNINGS OF FARM REAL ESTATE..... C. O. Brannen, Associate Agricultural Economist, U. S. Department of Agriculture	41
THE TREND IN LAND VALUES AND LAND UTILIZATION..... George S. Wehrwein, Ph. D. Institute for Research in Land Economics and Public Utilities, Madison, Wis.	45
MIGRATION TO AND FROM OUR FARMS..... Charles L. Stewart, Associate Professor of Economics, University of Illinois	52
THE TREND IN TENANCY AND OWNERSHIP..... A. M. Loomis, Secretary, American Dairy Federation, Washington, D. C.	61
AGRICULTURAL CREDIT FACILITIES—ARE THEY AMPLE?..... A. D. Welton, Continental and Commercial Bank of Chicago	69
PART III. THE FARMERS AS MANAGERS	
FARMERS AS MANAGERS..... W. M. Jardine, President, Kansas State Agricultural College	78
THE SERVICES OF AMERICAN AGRICULTURAL COLLEGES..... A. C. True, Specialist in States Relations Work, U. S. Department of Agriculture	88
CROP INSURANCE—ITS PRESENT ACCOMPLISHMENTS AND ITS POSSIBILITIES..... G. Wright Hoffman, Instructor in Insurance, University of Pennsylvania	94
THE AGRICULTURAL SITUATION AS VIEWED BY A WESTERN SENATOR..... Hon. Arthur Capper, United States Senator	121
A NATIONAL AGRICULTURAL PROGRAM..... Henry C. Wallace, Late Secretary of Agriculture of the United States	124
PART IV. THE MARKET FOR FARM PRODUCTS AND THE COST OF MARKETING	
THE FARMERS' FOREIGN MARKET..... Robert J. McFall, Massachusetts Agricultural College	129
A DOMESTIC MARKET FOR AMERICAN FARM PRODUCTS..... L. C. Gray, Economist in Charge of Land Economics, U. S. Department of Agriculture	156
THE AMERICAN FARMER AND THE TARIFF..... Charles W. Holman, Secretary, The National Co-operative Milk Producers' Federation	166

MEASURING THE SPREAD FROM FARMER TO CONSUMER	177
Walter P. Hedden, Research Agent in Marketing, U. S. Department of Agriculture	
COSTS AND MARGINS IN MARKETING	184
John D. Black and H. Bruce Price, University of Minnesota	
 <i>PART V. SELF-HELP THROUGH CO-OPERATIVE ORGANIZATIONS</i>	
THE EXTENT OF CO-OPERATIVE MARKETING AMONG FARMERS TODAY AND THE RESULTS SECURED BY CO-OPERATIVE ASSOCIATIONS	201
Benjamin H. Hibbard, University of Wisconsin	
FINANCIAL GAINS OF MARKETING SUCCESSFULLY THROUGH CO-OPERATION	208
Theodore Macklin, University of Wisconsin	
POSSIBILITIES AND LIMITATIONS OF CO-OPERATIVE MARKETING	217
H. E. Erdman, University of California	
SOUND PRINCIPLES IN CO-OPERATIVE LEGISLATION	227
John D. Miller, President, National Co-operative Milk Producers' Federation	
MARKETING FLUID MILK IN PHILADELPHIA—AN EXPERIENCE IN SALES CO-OPERATION	231
R. W. Balderston, Secretary, Interstate Milk Producers' Association and Philadelphia Dairy Council	
 <i>PART VI. FITTING PRODUCTION TO THE MARKET</i>	
SUPPLY AND PRICE INTERACTIONS IN FARM AND CITY PRODUCTS	243
H. A. Wallace, Editor, <i>Wallace's Farmer</i> , Des Moines, Iowa	
FITTING PRODUCTION TO THE MARKET	248
Robert J. McFall, Massachusetts Agricultural College	
THE PLACE OF ADVERTISING IN AMERICAN AGRICULTURE	255
George F. Johnson, Editor of Publications, Department of Agriculture, Commonwealth of Pennsylvania	
SCIENTIFIC NUTRITION AND THE FARM OUTPUT	258
E. V. McCollum, School of Hygiene and Public Health of the Johns Hopkins University	
FERTILIZER USE IN THE UNITED STATES	265
Sidney B. Haskel, Director, Massachusetts Agricultural Experiment Station	
EXTENDING FARM DIVERSIFICATION WESTWARD AND NORTHWESTWARD INTO THE GREAT PLAINS REGION AND THE SPRING WHEAT AREA	271
John Lee Coulter, Ph. D., LL. D. President, North Dakota College of Agriculture	
THE RELATION OF LOCAL FARM OUTPUT TO THE LOCAL PRODUCT	278
John M. McKee, Deputy Secretary of Agriculture, Commonwealth of Pennsylvania	
A BALANCED AGRICULTURAL OUTPUT IN THE UNITED STATES	285
W. J. Spillman, Agricultural Economist, U. S. Department of Agriculture	
BOOK DEPARTMENT	293
INDEX	302

FOREWORD

Food is the first of human needs.

We are changing from a surplus to a deficit agricultural economy in this country. This volume brings together the essential facts on the present agricultural situation by the best agricultural economists of the country.

The farm situation differs in economic position from the price situation in other industries. In other industries the price largely fixes output. In the farm industry more largely output fixes price. It is just this essential difference that makes agricultural co-operation so important to future American well-being.

Coupled with this essential difference lies also the important fact that we are changing from a nation of great surplus in food products to a nation of deficit in food production. Many argue from this fact that we can, therefore, be heedless of our foreign policies. But so long as a goodly margin of some of our farm products are still to be sold abroad, so long will only a vigorous foreign policy protect the interests of American farmers. To transfer from an agricultural surplus in exports to a surplus of food imports means that we will have to export increased quantities of manufactured goods; or go backward industrially. The interests of the farmers in this country and the future interests of manufacturers alike, therefore, call for such a foreign policy as will protect and develop every latent

market whether for American agricultural goods or for the products of American mines and factories.

In this period of adaptation of farm output to domestic market needs, agricultural co-operative sales agencies will take an important place. The law of supply and demand is not an iron law which admits of no human guidance. The experience of changing both supply and demand for milk in the Philadelphia market alone points to the possibilities as to what co-operative sales agencies can do in order to guide production to its best market. For this reason one entire section of the volume is devoted to co-operation and another to fitting production to the market.

Credit is particularly due to Mr. Robert J. McFall, of the Massachusetts Agricultural College. Mr. McFall helped by advice and by hard work both as a co-editor and as a contributor to the volume. The need and plan for the volume was suggested by Doctor C. H. Crennan, of the Editorial Council, now of the Continental and Commercial National Bank of Chicago.

The volume is sent out with the hope that it may add to a better understanding of the difficult situation in which American agriculture has been placed in the post-war period and a true understanding of the fundamentals that will lead to prosperous homes on American farms.

CLYDE L. KING.

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The Farm Income Situation

By ROBERT J. McFALL

Massachusetts Agricultural College

THE economic situation of agriculture should be subjected to tests similar to those used in judging the condition of any other industry. There are important differences between farming and other industries which must be recognized, but fundamentally the same economic tests must be applied to all classes of activity to determine the state of their economic well-being.

There are various important viewpoints of the economic well-being of a business which must be considered more or less separately. The interest of the rest of the business world which has commercial dealings with this industry is an important angle to consider. Then again there is the question of the business as an operating concern. If a business is successful as an operating concern and is a socially necessary business, operations will not be stopped merely because of unduly heavy capital charges, for capitalization can be reorganized. The complete business status, including capital charges, must also be considered. This gives what is virtually the angle of the business which is of interest to the operators.

REASONABLE CRITERIA OF AGRICULTURAL PROSPERITY

In the case of farming, this latter consideration is the interest of the farmers themselves as a group. The interest of the hired laborer is normally in his wages and terms of employment. In farming, however, there are so many gradations between hired laborers and operator-owners, on account of share-cropping, that it will be wise, if possible,

to consider the well-being of all the people as a group that are engaged in farming.

The interest of the rest of the business world in any industry is in its capacity to pay for the commodities and services of others. This reduces itself to the gross income of the business in question, whether the business be railroading or agriculture. It may be argued that capital charges and taxes should be subtracted from this gross income before the purchasing power is estimated for this purpose. Properly speaking, these should not be subtracted. The presence or absence of money available to meet capital charges, whether interest on mortgages or returns to the operator-owner, affects the amount of money distributed from farming directly or indirectly in payment for other goods, securities or services. The public income from taxes is spent for goods or services, and this expenditure requires the income out of which taxes are paid. Heavy taxes may divert the stream of income from the purchase of a new car to the payment for a better road for the old car, but in any event the gross income finds its way into purchased goods, services or securities, including savings deposit receipts. Consequently, the gross income of the industry in question, excluding duplications arising from transfers within the industry, is the proper index of the purchasing power of that industry for the goods and services of others. The other non-sentimental interests of the outside world lie in the supply of goods for which the income was received and in the assurance of a continuation of

production and spending power, which in turn depend upon the prosperity of the industry itself and the people engaged in it.

The prosperity of the industry as an operating proposition depends largely upon the relation between the gross income and the price level of the goods and services required by the industry itself for operation; in other words, on the purchasing power of its own income in the terms of the goods and services which it uses.

The complete business status of any industry and the interest of those engaged in it must take into account the gross income of the venture and what current expenses, and fixed and other charges, must be met before the net income, if any, becomes available to the owners. There are many questions which are subsidiary to this proposition.

The price of the articles for sale is one of the greatest factors in determining the size of the gross income. Size of output, however, is just as important as price in its influence upon income. A high price scale may wreck a business, while an increased turn-over at lower prices has made many fortunes. It is quite unsafe to assume here that farming is different from other industries, in spite of classical theory. The current expense account, also, with its various sub-classifications, is most vital to the well-being of any business and the people engaged in it. A few years ago it was very common for the current operating expenses of the railway corporations to be almost equal to, or greater than, their operating income. The shareholder's interests were not well cared for at that time. In farming, the main items in the current expense account include things which must be purchased for the business of farming, but not things purchased for the personal use of the

farmers and their families. Fertilizers and other raw materials, such as feed and feeders, as well as fencing, farm implements, farm machinery, gasoline and other power materials, and repair of buildings, must be provided for in the current expense account. Labor expenses must be considered when estimating the well-being of the business itself and that of the operators, but must not be subtracted from the gross income when an attempt is made to judge the well-being of the whole class of people engaged in farming, including hired laborers, share croppers, tenants and operator-owners. Properly speaking, the maintenance and depreciation allowances for such semi-permanent goods as farm machinery and buildings should represent these goods on the expense account. Where the farms are kept uniformly well supplied with such articles it is as well to disregard the refinements of accounting theory, and to consider current expenditures for purchases and the repair fund in the farm expenses. In periods of depression, however, all businesses, including farming, temporarily reduce their expenditures for purchase and maintenance of equipment. In the long run, however, it is necessary to make up for such scrimping.

As a matter of accounting, all taxes assessed against the farm and buildings other than dwellings must be counted as current expenses of the business. Personal taxes, such as those on income, dwelling houses, pleasure cars, etc., do not belong in the business or farm expense account; they come out of the farmer's own personal net income, if he has any.

After all strictly operating expenses have been subtracted from the total income, we are in a position to estimate the condition of the business as an operating concern. Operating expenses must include wages paid and

should consider wages due the operators for their services. Interest on mortgages and other interest charges do not, on the other hand, appear in strictly operating expenses. If the business shows appreciable profits after paying these operating costs, we may anticipate that it will continue. The extent of the profits will determine the extent to which capital may be profitably invested. The relation between the income and the items which make up the operating expense shows the purchasing power of the industry as an operating proposition. If this purchasing power is falling, the operation of the industry is jeopardized.

The well-being of the owners and operators in any business depends not only on the relation between income and operating expenses, but is just as much affected by fixed charges and all over-head expenses. The farm business, just as that of a corporation, must pay over-head or fixed charges on its capital or reorganize its capitalization. A business may be perfectly sound as an operating proposition and yet be so burdened with over-head charges that it is ruined as a corporate proposition.

In the long run, over-head charges cannot be paid excepting after reasonable current expenses, based upon efficient operation, are met. When mortgage holders foreclose, it is on the understanding that some other farmer will pay interest charges after meeting his current expenses. If it is impossible to meet fixed charges after providing for proper running expenses, then the income must be increased through increased size of business or better prices, or the over-head or fixed charges must be reduced.

It has been a very common thing in the past in agriculture, as well as in other business ventures, for the real estate and the capitalization of the business to be valued on an inflated

level as compared with the current earning capacity. Securities in corporations have frequently been floated on the basis of earnings anticipated for some more prosperous future period. Land, both in cities and in the farming communities, has been bought and sold at prices markedly higher than the current earning capacity of that land either in production or when rented. In so far as this was true in normal times, it may safely be said that two businesses were combined; production and speculation. Farming and land speculation have been inextricably mixed up in this country. To the extent to which land speculation has inflated the price of farm property, it is not proper to count either interest or taxes on this price as an expense of the business of farming. Such excess charges belong properly to the business of land speculation. In prewar days this latter business probably subsidized true farming and artificially depressed farm prices for the farmers who were not also land speculators. In these last few years it has been a common custom to consider the losses in land speculation as a charge against farming. So also, it has always been a common custom to charge the full over-head capital expenses to the business of farming. We shall see later what an unfortunate effect this has had upon the estimates of costs of production of farm products.

It probably is true that there is a third basis for the selling values of farm real estate. Farmers bid against each other for the possession of farms in order to secure for themselves a home and property which they own and on which they may be relatively independent. In England the social prestige of land ownership is a very powerful factor in determining real estate prices. In this country it is a more powerful factor than is generally rec-

ognized. This is not the same as speculative value, but for convenience will be classed with speculative value.

Under the heading of over-head costs must be considered the customary rate of interest on the proper value of the land, buildings and equipment devoted to the business of farming. Interest on investment in the personal dwelling is largely a personal rather than a business expense. It is true, however, that most farm dwellings are used for farm business as well as for strictly personal purposes. Following the foregoing discussion of speculative values, we must avoid the charging of interest on that portion of the capital value which is speculative. A fair rule of thumb would be to substitute for interest a payment equal to customary rental charges in the neighborhood and count that as a true farming cost, assigning the remainder, if any, to speculation. What interest is due on mortgages and notes given for current capital is strictly a fixed charge and probably seldom greatly exceeds a legitimate charge on farming in normal times. Interest on land or current capital owned by the farmer is not, strictly speaking, a fixed charge, but it certainly is a proper over-head expense for the farming business. It should be paid to the farmer as a land owner before we can estimate the "complete business status" of agriculture.

It frequently happens that farming, just as any other business, is capitalized more heavily than the combined operating and speculative businesses can stand. In such a case financial reorganization is in order. In the case of our large corporations a great deal of adjustment of capital values comes through the shifting selling values of the securities. If the earning capacity gets so low that current expenses eat up so much of the gross income that actually fixed charges cannot be met,

a drastic reorganization is in order. In farming it is not so easy to reorganize the capitalization. Farmers as a class feel a personal obligation to pay off all capital borrowed. They are not educated to the conception of corporate limited liability where the obligation is on the business solely, and not on the person. It is true also that a mortgage is usually accompanied by a personal bond. There is also another decided difference in business custom between farming and other ventures in the relation of the interested parties to the business after financial reorganization. A merchant or manufacturer may go through receivership and retain his personal connection with the business after the capitalization has been adjusted to the earning capacity. A farmer "loses his farm" when his capitalization is reorganized.

After all business expenses are paid and the "complete net business income" discovered, there remains the personal business income of the farmer. It is this residue which must be considered in estimating the prosperity of the farmers as a class of economic producers. It is this residue when compared with the prices of goods and services used by the farmers and their families personally which gives the purchasing power of the farmers as such. When this residue, if any exists, is ascertained from the total income of the whole nation's agriculture, it is necessary to take account of the change in the number of the farmers among whom this figure must be divided as the years pass. The net income of the individual farmers is varied correspondingly.

Personal taxes might be supposed to be subtracted before arriving at the real personal purchasing power. However, all taxes not definitely classable as contributions due from the individual and counted as personal expenditures

should be provided for as an expense of the business and are already deducted. Moreover, a very large part of the farmers' taxes, business as well as personal, are in reality merely the payment for public purchasing of group requirements. Personal taxes are not a *quid pro quo* for the individual, but for the agricultural population as a group they are largely a *quid pro quo*. The school tax is a group expenditure for the benefit of the community group, although some individuals in the community may receive no direct benefit. The national taxes which give a less direct return to the group are largely indirect or income taxes. Income taxes have had but little effect upon the farmers recently. Indirect taxes appear in the price of commodities and services purchased and are fully accounted for when the purchasing power is derived by the use of purchase prices. In an index of spending power personal taxes must certainly not be deducted from the farmer's income. For all practical purposes it is a question if farm taxes should be deducted from income before computing the purchasing power for the agricultural group or the average or representative farmer. Since we cannot separate the various classes of taxes due from the farms and the farmers it will be necessary to consider the net business income of farming in two ways: with taxes included as an expense and with taxes excluded from the expense account.

In finally summing up the economic status of those engaged in agriculture, several phases of the matter should be considered as far as the data permit.

The status of the operators should be presented. In doing this, wages should be counted among the operating expenses. After all operating expenses, and fixed charges for capital and allowances for capital owned by the farmers are considered, the remainder is

the income of the operating farmer from his farm operations. He personally has in addition the allowances for his own work and his own capital invested in the business. His business income as a farm operator and his total income as a farmer and land owner should both be considered.

Wage data are available to show the income and terms of employment of the hired laborers. However, as already noted, there are so many share-croppers and tenants in addition to the hired laborers and operator-owners that it seems best to examine the status of the whole group of people engaged in agriculture. To do this it is necessary to return the sum paid for wages to the income available for distribution (or not to charge it in the expense items) and to distribute the total income among all the people engaged in the business.

X COST OF PRODUCTION

There is considerable feeling in the country today that farm prosperity should be estimated in the light of cost accounting as applied to the production of farm products. Unfortunately, the keeping of general farm accounts is so uncommon that we have not much to hope for from the more intricate and deceptive cost accounts.

There can be no question but that cost accounting is a very valuable thing for some industries. However, it is a difficult thing to apply to industries where the problem of "joint costs" is a serious factor, as it is in most farming operations. It is a safe thing to say that no cost accounts are reliable if their results are not checked against a system of general farm accounts which leads up to an annual general balance sheet. The rarity of balance sheets for farming operations and the absurdities which have been committed by costing enthusiasts in

industries better able than farming to maintain proper cost accounts lead us to accept with decided reservations the findings of cost accounting applied to agriculture as a test of its prosperity.

There can be little or no question but that the application of cost accounting to agriculture as an educational measure is very much worth while, unless the methods employed are too erroneous. Such efforts should show the farmers very valuable facts on the comparative costs of different crops, combinations of crops and different methods of farming. Failure of the cost accounts to check with the balance sheet might not vitiate such results, and again even unduly large cost estimates might stimulate desirable economies.

This is no argument for the application of cost accounts in an absolute sense to the problem of farm prosperity. It is true that in this latter field cost accounts, if reduced to an index, may shed light upon the comparative prosperity in different times and different places. As a criterion of the agricultural prosperity of any community or time taken alone, however, cost accounts, as commonly used, must be taken with considerable reservation.

In New England we have heard much of the cost of production of milk. It has been the aim (not by any means always attained) of the organized dairy farmers to secure a price for that portion of their milk going into fluid sales which will equal the cost of production as worked out in accordance with the best accepted theory. Somewhat less than half of the total production in the whole section goes into such fluid sales. The rest is disposed of for much lower prices. In Vermont about one-third of the milk goes into fluid sales. As a result, the average price is materially lower than the theoretical cost of production. This

price, moreover, has recently been higher, as based upon prewar figures, than the general price level. In this case low price cannot have been the driving force in the expansion of production; the milk price has been very satisfactory as compared with prices of raw materials. And yet in the past four years the milk production of Vermont has increased by about 25 per cent. The presumption is that it was profitable for the farmers to increase the production even though the theoretical cost figures showed a loss.

The probable reason for this is that the cost accountants attempt to consider dairy farming as a separate enterprise. Dairying is considerably more expensive as a separate enterprise than it is when conducted in conjunction with the production of cash crops. The Agricultural Extension Services of Massachusetts and Vermont have recently issued a joint bulletin which states quite clearly that the farmers can hope to make money out of dairying only when combined with other farm ventures.

Light on this question is shed from another enterprise in a distant place by the evidence presented to the British Royal Commission on the Importation of Store Cattle.¹ The fattening of cattle is not generally profitable excepting as practiced in conjunction with other types of farm enterprises. It is unnecessary to multiply examples of profits from proper combinations of efforts when any one of these efforts taken singly would be futile.

Another serious defect in cost accounting as applied to agriculture results, perhaps, in still more disastrous conclusions. It is a common practice to include, among the items of cost, interest on the total investment in the

¹ Proceedings before the Royal Commission on the Importation of Store Cattle, London (Cmd. 1541).

farm. We have already remarked upon the fact that much agricultural land has been bought and sold on a valuation based upon speculation rather than upon its present productive capacity. Land values in the West have very commonly in the past been held for prices which included a speculative element. Much of the land near our cities, in the East as well as the West, always includes in its selling value a large influence from its potential use in the future for urban purposes. The holder expects a return on this speculative value from the sale of the land. It is not good accounting to demand also a return on this from current farming operations.

The most serious side of this matter is that if a fair return on this speculative part of land value is allowed in the cost and at the same time is secured in the price of the products, the land valuation will be pushed progressively higher. The selling price of land which includes a speculative element of gain must keep above its capitalized earning capacity. If the price of farm products were raised to meet the land value every time the latter rose, the most vicious type of inflation would occur and depression be sure to result.

PRICES OF AGRICULTURAL PRODUCTS

The most popular criterion of agricultural prosperity is the price level of unit quantities of farm products. Taken alone this criterion tends to be misleading. When combined with information as to the variations in the quantity of output and the expenses of production, price data are very valuable.

The wholesale prices of agricultural products rose more than twice as rapidly as the general price level in the decade and a half before the war. In the field of world trade, as shown by British data, agricultural prices rose almost exactly twice as fast as all

prices. At the beginning of that period of comparison, as Dr. Friday shows so clearly from quotations from current publications of the time, agriculture was accounted very prosperous.² During the war the agricultural price level rose more rapidly and to greater heights than the general price level. Since the quantity output was increasing in total and per man employed during that period as a whole, we may concede increased prosperity. Since 1919 drastic price declines, affecting agricultural values more heavily than the general price level, have taken away a large part of the earlier gain. Comparing the year 1923 with the year 1900, we find that wholesale prices of farm products have increased 103 per cent, while prices of all commodities have increased 90 per cent.³ The purchasing power of unit quantities of farm products has increased somewhat during that period, which began, we are assured, with marked prosperity.

It is argued that it is unsafe to use such a distant base for reference and that the year 1913 or the half decade 1910-14 should be taken as the base.⁴ It is true that the more distant the base the more disturbing factors enter, but it is not safe to assume that the changes have all been for the worse with the farmers. Poorer lands have been brought under cultivation in the West in the past decade than in the one before. At the same time poorer lands in the East have been abandoned. Meanwhile agricultural technique has improved and, as we shall see, the cost of production has decreased per unit in terms of human labor and land.

² Friday, D. R.: The Course of Agricultural Income During the Last Twenty-five Years. *American Economic Review*, Supp., March, 1923, pp. 147-158.

³ Publications of the Bureau of Labor Statistics.

⁴ Warren, G. F.: The Agricultural Depression. *Quar. Jour. Econ.*, Feb., 1924, pp. 183-213.

If the year 1913 is taken as the base, the wholesale price of farm products rose 42 per cent by 1923, while the general price level rose 54 per cent. As a consequence, unit quantities of farm products declined in their purchasing power by 7.8 per cent. When taking the year 1913 as the base, it must be carefully kept in mind that this was a very prosperous period for agriculture in comparison with other times. Farm income had been increased by both price and quantity for a decade and a half since the prosperous year of 1900.

Farm prices are available for the comparison with 1913, but not with 1900. Such prices gathered with the same margin of error as wholesale prices would be much more valuable for the purpose at hand. However, it is difficult to conclude that farm price data can be as accurate as wholesale price data. Wholesale prices at principal markets are fairly well standardized; it is possible to estimate them within a fairly small margin of error. They are reported and published by many parties with all kinds of "bias." Moreover, published price lists are available for the use of the statistician in constructing wholesale price indexes. A reasonably accurate representative price can be found and used, although the errors are greater than supposed by the uninitiated. In the case of farm prices there is no such comparative stability upon which to base estimates. There are practically no standards of quality at the farm upon which to base representative prices. There is a very great variety of price on any product even in the same community at the same time. Since the prices cannot be published in such a way as to be directly checked, excepting for generalities, there is great difficulty in eliminating the "bias" of the reporters. Even in the matter of reports of

quantity of crops produced, the personal "bias" of the reporter is a very serious matter to the correction of which the U. S. Department of Agriculture has devoted a great deal of energy. "Bias" in the findings of country reporters is particularly strong in abnormal times. By the use of various checks, the errors in the final crop reports due to this cause are less than they otherwise would be. Reports on price are much harder to check. There can be no question but that there is a great deal of "bias" these days in the agricultural community on this matter of price; a "bias" which will be bullish in prosperity and bearish in these last few years.

These farm prices, published as such, show a variation in movement from wholesale prices of farm products. The direction of the variation is such as would be anticipated from either the "bias" of the correspondent or from actual economic movements. Just as retail price movements lag behind those of wholesale prices, so wholesale prices tend to lag behind those of farm prices. Available data on farm prices indicate that they have dropped to considerably lower levels than the general index numbers. The farm price of the Department of Agriculture stood at 136 for crops, 103 for livestock, and 120 for the combination in 1923,⁵ while the Bureau of Labor Statistics' index of the price of farm products stood at 142, and that of all commodities at 154. The index of railway rates on farm products stood at 158.6 for 1923 on the same base of 1913.⁶ This latter point is noteworthy, since railway rates are the chief item standing between farm prices and wholesale prices at the chief markets.

It is difficult to believe that the other

⁵ The Agricultural Situation (U. S. D. A., multigraphed publication).

⁶ *Agriculture Yearbook*, 1923, p. 1177.

expenses of marketing between farm and wholesale market have risen so drastically as to cause all this discrepancy between these two price indexes. However, there is some statistical evidence to prove this tendency for prices to vary from central market prices as we go nearer the farms. As conditions create a "buyers' market," a tendency arises for "bargain prices" to appear at points near the surplus-producing regions. A general study of seasonal marketings and prices for storable crops indicates a greater price decline at harvest than can readily be ascribed to carrying charges. A Canadian study made in prewar days showed a marked tendency for Winnipeg and Liverpool prices of wheat to draw wide apart in the months in which the Canadian grain was flooding into the markets.⁷ Recent events have shown that the Argentine with its large supplies of meat pressing for outlet has seen prices much lower in comparison to world market prices than are the American prices.⁸

The Department of Agriculture also publishes data on total net value of production which, by a simple process of division, yield index numbers of farm prices on a completely weighted basis.⁹ The weighting shifts automatically from year to year as the relative output of various products changes. This gives a better index of what the farmer actually receives. These data are checked against census findings and give more weight to the prices obtaining at the seasons of heavy marketing than the index numbers referred to above which give an average of all months. When we take these total value data of the department for

crops alone and modify the index of the value for the increase in "mass of crop production" shown in the same table, we find an index of value or price of unit quantities of 152.2 on the base of 1913. This is considerably higher than the index of farm prices of crops referred to above, which was 136. Part of the discrepancy may be due to the fact that these bulk figures are affected by whatever shifting of production occurs from less to more profitable lines.

It is commonly argued that agricultural prosperity is impossible so long as the price level of units of farm products is not as much above the 1913 price level as the prices of other commodities are above their 1913 level. One writer even goes so far as to conclude that "real prosperity on farms" necessitates "a price level as high as the general range of prices at which the bulk of the indebtedness was incurred."¹⁰ The latter phrase refers at least partially to the large capital charges laid on the farms during the period of inflation at the end of the war.

Such conclusions seem unwarranted when viewed in the light of business experience in other fields. Many examples of real prosperity in industry could be cited from the past and the present. It is only necessary to point to the industry built up by Henry Ford, expanded during the war period of inflated prices, paying high wages to-day and selling its products, not only at a smaller purchasing power than in 1913, but at a lower purchasing power than the most pessimistic showing for agricultural products; in fact, Ford cars sell today for much less than prewar prices and yet Mr. Ford is reputed to have made himself among the nation's most wealthy men. Gasoline also sells today for low prices (even

⁷ Georgian Bay Canal Commission, Interim Report, 1917, p. 56.

⁸ Arner, G. B. L.: The Cattle Situation in Argentina (U. S. D. A., multigraphed publication).

⁹ *Crops and Markets*, Supp., March, 1924, p. 84.

¹⁰ Warren, G. F.: The Agricultural Depression, *Quar. Jour. Econ.*, Feb., 1924, pp. 183-213.

below the prewar levels) and yet the various leading oil companies are reported to be thoroughly solvent.

We are sometimes told that increased quantity of farm production has come because of the necessity for more units to sell at the lowered prices.^{9a} In other words, we must believe that increase in production has been the effect, not the cause, of low farm prices. Doubtless, many individual farmers, anticipating at sowing time a low price at harvest, have increased their sowings accordingly. Throughout the country as a whole, however, this has not been the situation. As the latest *Yearbook of Agriculture* states regarding the period of price decline, "Since 1920 the area of farm land and of improved land has increased very little, possibly not at all, and the acreage in crops has decreased since 1919."¹⁰ The increase in acreage since prewar days occurred while prices were rising rather than as the effect of falling prices. It is worthy of note that the acreage of wheat has declined continuously during these past years when wheat prices were comparatively low. On the other hand, in New England, where the farm price index of market milk stood at 156 for 1923 (on the basis of 1910-14) and butter at 158, the production of milk has increased very markedly.

The claim advanced at times that those now engaged work harder than was the custom in earlier days makes but little headway in the light of what is known of the hard toil devoted to farming in days gone by. Mechanical devices and better technique save much human energy today. It is a well-known fact in the East that one seriously disturbing factor in the milk market is the general desire to sell whole milk in order to avoid the use

and washing of the separator. It is asserted by some of those acquainted with the West that the wheat market has been flooded by farmers preferring the hard work of a few months to the year-round work required by diversified farming. The production of today calls for hard work, but proof is lacking that the toil is more burdensome than that of the past. Certainly no more people are employed to produce a larger quantity. It is hard to believe that the farming population increased its efforts per man enough to affect the increased production per man as shown by the statistics. It is more natural to suppose that the expenditure of millions of dollars these past few years to carry agricultural education to the farmers has had its effect and that the increased production has been the result of the work of brains as well as brawn.

Many writers fail to face the fact that unit prices alone do not tell the whole story of the farm income. Other writers admit the fact that the quantity of production affects income as truly as does price, but refuse to face the logical conclusion that the product of unit price and quantity, which constitutes the total income, is the real basis for judging the economic status of the industry.

An apparent justification for this attitude may lie in a narrow interpretation of the classical theory of increasing costs of farm production. If the cost of farm products always increases per unit of output as production increases, agricultural distress must exist when an increase has occurred in the quantity of production while unit prices of farm products have fallen in comparison to prices of other goods. In such circumstances, the greater the production, the greater the distress of the farmers. Nevertheless, even in such circumstances, the purchasing

^{9a} See p. 9.

¹⁰ *Agriculture Yearbook*, 1923, p. 437.

power of the industry (which is often hopelessly confused with that of those engaged in it) would still be determined by the total income. On the other hand, if, perchance, increased production and decreased costs per unit of product come together, real agricultural prosperity might come with a decreasing purchasing power of farm products.

It is generally admitted that there is a law of diminishing returns or increasing costs in agriculture. It is not true, however, that increased agricultural production always involves greater cost per unit of product. Greater application of labor and capital to land in certain conditions may give larger production with actually lowered costs per unit of product. This fact is commonly conceded by careful students when the amount of labor and capital employed is still small. As the amount of such application is increased, however, a stage is reached beyond which the cost per unit of product ceases to fall and starts to rise. These stages of decreasing and increasing cost appear as either labor or capital or both are applied with gradual increases while the agricultural technique remains unchanged. If the agricultural technique is improved while the application of effort is being increased, it must result that the stage where costs per unit begin to increase will be pushed further along in the intensification of production. Improved technique may very considerably extend the possibilities of increasing production per acre without increasing the cost per unit. Eventually a limit to this process must be reached. However, the combination of the fact that at any stage of agricultural technique there are limits within which greater effort will bring lower costs for the product and that there are great improvements available in the technique, makes it possible for the average farm situation

in a country like this to continue for a surprisingly long time in the stage of decreasing costs. Doubtless many fields in the country are now in the increasing cost stage. Certainly the time may be anticipated where the average farms of the country will be operated at increasing cost even with improving technique, unless other factors than the supply of farm products reduces our population growth to a pace slower than the advance in farming methods. The question for the point at issue, however, is the application of this law of cost variations to the present time and the average farming conditions in this country.

The recent history of this matter is not without interest. In spite of the high prices at the end of the war, the trend of food prices for the period from 1810 to 1920, as a whole, was distinctly downward.¹¹ It might be said that the rising price level in the twenty years before the war was merely a recovery from the over-violent drop in the preceding decades. Prices and costs are different matters, but in the course of a century they must keep pace with each other quite closely. Accordingly, we may safely say that the cost of food production in terms of dollars has declined throughout the past century as a whole. The dollar is not the ultimate standard of cost. Human effort is the ultimate standard. During this period units of human effort employed in industry received materially greater payment in wages in dollars. This is shown by wage data both at home and abroad.¹² Since food costs were falling in terms of dollars and the wages of human effort were rising in terms of the same measure of value, it must be conceded that food costs

¹¹ Hurlin, Ralph G.: *The Annalist*, July 4, 1921.

¹² Douglas, P. H.: unpublished studies. Kitchen, Joseph: *Trade Cycles Chart*, *The Times* (London), January 8, 1921.

were falling very materially in terms of the ultimate measure which is human effort. This portrays the cost of the purchase of food rather than the actual cost of production in terms of labor employed in farming.

The comparatively short period of rising food prices of this last quarter century did not reverse this trend in prices in terms of human effort. It did check the rise, however, at least temporarily. At the same time the rapid increase of farm land values appearing during that period indicates that a part of the increased price was going into increased farm profit rather than cost. Even in this last quarter of a century it would appear that the cost of food in terms of human effort required for its purchase had actually declined.

During the past century the percentage of population engaged in agriculture has fallen very materially.¹³ The supply of farm products has been increased to meet the growth of population, but a larger part of the workers has been drafted into the newer industries. In 1870 the agricultural workers were nearly 16 per cent of the population. In 1920 only a little more than 10 per cent worked on the farms. Since 1870 the product per unit of labor employed on the farms apparently has about doubled.¹⁴

During the past census decade the agricultural production increased by about 16 per cent,¹⁵ while the area of improved land was increased by only about 5 per cent and the persons employed actually decreased, according to the census, by about 10 per cent. This last figure is subject to some question on account of the change in the census

date. It must be recognized that the decrease in land and human labor employed per unit of product may be offset partially or wholly by changes in capital or outside services in the use of fertilizer, machinery, etc. It seems certain that the spectacular increase in productivity per man in the last half century as a whole is partially due to increased use of machinery or what might be called the indirect use of city labor. What influences have been at work in this direction in this last decade will be discussed in detail later in analyzing the farm expense account. It may be noted in advance of this discussion, however, that there is no evidence that changes in the use of such "outside services" have wiped out the economies in the direct use of labor and land.

There are very many opportunities today for decreasing the cost of production of farm products while expanding their output, and that without resort to the time-honored custom of bringing into use new supplies of virgin soil. Some of these economies lie in the production of crops, some in animal husbandry and some in better combinations of the two. Many of them are already partially utilized in practical farming. A careful survey of the situation shows, however, that many known economies are but imperfectly utilized in practice at present. Inertia, lack of knowledge and the fact that decreased cost per unit of product is of less importance to the farmer than increased profit per acre, keep economies from being adopted as rapidly as they are discovered. It is fortunate that there are such brakes on the wheels of progress. An unduly rapid adoption of known better methods might cause such an increase of production as to ruin the farmers through reduced prices. Many known improved farming practices are in process of gradual

¹³ Babson, R. W.: *Journal of Farm Economics*, January, 1924, p. 43.

¹⁴ *Agriculture Yearbook*, 1923, p. 463.

¹⁵ Computations of W. W. Stewart and E. E. Day.

adoption; many improvements will yet, doubtless, be discovered.

In the matter of animal husbandry much has been accomplished in increased meat production per thousand of the livestock population in this last generation through younger slaughtering alone. This materially reduces the feed consumption per unit of meat produced. Such economies are by no means exhausted. In milk production the census data would indicate that the economies in production coming from the use of larger producing cows were but very imperfectly utilized as yet. It has been calculated that a cow producing 300 gallons of milk a year requires 4.7 pounds of "starch equivalent" to produce 1,000 calories in the form of milk, while a cow producing 800 gallons requires only 2.9 pounds for the same energy equivalent in milk.¹⁶ Not only does the cost of milk in terms of feed consumed decrease with better yielding cows, but the cost decreases just as truly in terms of money spent per unit of production.¹⁷

In the matter of crop production, similar opportunities exist for cheapening unit costs of production while expanding the output. The latest (1923) *Yearbook of Agriculture* contains a most instructive chart on the relation between costs per ton and yield per acre of sugar beets as shown by cost surveys in Utah and Idaho.¹⁸ It is shown that a small increase in cost per acre is accompanied by such an increase in yield that the costs per ton are very much lower where the yield has been increased. Surveys of cotton farms indicate that this result is not confined to one crop.¹⁹

¹⁶ The Food Supply of the United Kingdom, by a committee of the Royal Society, pp. 27, 28 (Cd. 8421).

¹⁷ *Bulletin No. 7*, Conn. Agr. College, Extension Service.

¹⁸ *Agriculture Yearbook*, 1923, p. 199.

¹⁹ *Department Bulletin* 648, U. S. D. A.

The results of fertilizer experiments show that the proper use of this aid to production may readily decrease the cost per unit of output before reaching the stage of decreasing returns. The experiments conducted at the Ohio Agricultural Experiment Station show clearly in the case of wheat production that the moderate use of fertilizer materially reduces the cost of production per bushel.²⁰ Limits to the possibilities of this efficiency exist of course, but the country as a whole is using fertilizer very sparingly as yet. The average national agriculture is easily within the stage of increasing returns from the use of this one factor in production.

Improvements in the combination of various farm enterprises are also contributing to the efficiency of our national agriculture. One of the outstanding efficiencies which have been finding their way into our agriculture and contributing to the lowered costs per unit is the increased plowing up of pasture lands, thereby making better combinations between the raising of crops and animal husbandry. The British scientific agriculturalists have for years been pointing out the increased economy which results from the conversion of pasture into plowland.²¹ An acre of cultivated land can normally produce as much feed for livestock as an acre of the same land in pasture, and can at the same time produce a material amount of food for direct human consumption. The British farmers do not take kindly to this advice. The American farmers, however, appear to have made considerable progress in this direction. More human labor per acre is required thereby in the same stage of agricultural technique, but the British scientists claim that with their labor costs, the total result gives a net profit and smaller

²⁰ See page 268, *infra*.

²¹ Middleton, T. H.: various publications.

cost for the resulting increased products.²²

There are many opportunities today for decreasing the cost of agricultural products while increasing their output. Moreover, it has also been shown that the nation-wide tendency even of late years has been for increased production with the use of less land and labor per unit of output. The result has been that the long-time trend is for food prices to fall rather than rise in terms of fundamental units of cost required to purchase the food. We shall not immediately conclude that there has been such a decline in the cost of production as to give greater profits to the farmers in spite of falling prices. We do suggest, however, that this collateral evidence is so strongly against an unproved assumption of hardship as the certain accompaniment of declining prices that the whole case of farm profits should be investigated on its merits and subjected to the tests which would be applied to any other business. We shall, accordingly, look into the question of the real agricultural income and the various expenses which must be charged against it.

TOTAL AGRICULTURAL INCOME AS A CRITERION OF PROSPERITY

The best basis for estimating the economic status of the farm business itself, as an average for the whole country, is found in the estimate of the Department of Agriculture of the value of the total production of farm products, excluding duplications. These data eliminate the difficulty introduced into some estimates by the double counting of animal products and the crops from which these were produced. The duplication involved from the transfer of animals and feed from one farm to another directly or through

commercial channels is also eliminated. We have the value of the net out-turn of the business of farming as such, including the food and other supplies used by the farmers from their own farms. The estimate is the true figure for the total income of the business of farming, excluding transfers and duplications. It is checked against census data and must be accepted as reasonably reliable. It takes account of increased quantity of production as well as price. The regular compilation upon which index numbers are constructed includes only items used in the census list of 1919. The inclusion of additional items which have been estimated for the last few years would slightly increase the index of 1923 over 1919.

INDEX OF VALUE OF FARM PRODUCTS ON BASIS
OF 1919 PRICE LEVEL ^a

Year	Crops	Animal Products	Total Excluding Duplication
1913	100.0	100.0	100.0
1914	99.7	101.8	99.5
1915	112.6	104.1	109.1
1916	147.6	117.1	125.7
1917	219.8	157.4	188.0
1918	233.7	219.3	235.0
1919	247.9	195.7	231.7
1920	174.5	169.1	179.9
1921	111.0	124.0	125.5
1922	143.4	131.5	145.0
1923	160.2	138.6	156.2

The index of this farm production value, or business income, stood at 125.5 for 1921, 145 for 1922, and 156.2 for 1923. These figures are the best data available upon which to base the purchasing power of the farming business itself for goods, services and investments, whether spent directly by the farmers or their creditors. When

²² Middleton, T. H.: *Food Production in War*, p. 341.

^a See p. 9.

deflated by the change in the purchasing power of money as shown by the general wholesale number of the Bureau of Statistics, they become 85.4 for 1921, 97.3 for 1922, and 101.4 for 1923. To the extent to which the change in the general wholesale price index depicts the changing value of the dollar, these last figures show the purchasing power of the business of agriculture for goods, services, etc., as related to the status of 1913. They show a serious lack of purchasing ability in 1921, but a practically normal situation in the last two years. Preliminary estimates indicate that conditions have improved still further in 1924. And it must be emphasized again that 1913 was a comparatively prosperous year for agriculture.

These figures illustrate the deflated ability of agriculture to pay for goods for current and capital use and services whether private or public as obtained through taxation. Viewed from the standpoint of those desiring to supply this industry with goods or services, the figures as they stand are probably most satisfactory as the purchasing power of the business of agriculture. Each class of outsiders must also consider how the change of price for his goods or services compares with the changes of the general wholesale index number.

Viewed from the standpoint of agriculture itself these figures leave much to be desired. An index of the price of current requirements of the business of agriculture is very much needed. Dr. Friday made a suggestion in this direction in 1922.² Judging from certain raw data on prices of these requirements in the *Yearbook of Agriculture*, the department is probably considering such a contribution. This index number should include the prices of all commodities required for the business of farming, using the type of price on

which the goods are usually acquired, for some goods are purchased at farm prices, some practically at wholesale and many at retail. Feed and feeding stock are purchased on a type of price quite dissimilar from the basis of the general index of retail prices, which covers consumers' goods. Suitable weightings, of course, should be developed. It should also be made possible to include or exclude at will the prices of farm products purchased or transferred as raw material in the industry. These should certainly be included when comparisons are made with unit prices or total incomes from individual farms.

Unfortunately, such index numbers have not yet been constructed. The Bureau of Labor Statistics' retail index is useless for this purpose. Their wholesale index leaves much to be desired, nor is it safe to modify this before using it. The low item of farm products might be eliminated for some uses, but, if so, the high items of fuel and lighting should also be dropped. These latter items apply almost exclusively to personal rather than business expenditures in farming, unless for gasoline as a fuel, the index number of which is phenomenally low. Moreover, farm products constitute one of the greatest items of expense in the business.

Since it is impossible at present to construct an index number for farm requirements as they exist, it is best to leave this stage of the matter as it stands and use the total income deflated by the use of the wholesale price index number. Thus we conclude that the figure of 101.4 is the nearest approach possible at present to a satisfactory index of the total purchasing power of agriculture as an operating business, including with direct purchases the indirect demand for outside goods and services through the media

² See p. 7.

of taxes and payments for interest and discharge of capital obligations.

An index of the direct purchasing power of the whole business of agriculture may be estimated after subtracting the interest or indebtedness and the farm taxes from the gross income. This leaves the amount available for direct expenditure by owners and operators for commodities and services, personal and business combined. Taxes on farm property in 1923 are estimated to have been about \$850,000,000, against \$344,000,000 in 1914.²³ Interest on mortgages and other debts in 1923 has been estimated to amount to \$952,000,000.²⁴ The best estimate available for interest payments in 1913 amounts to \$228,000,000.²⁵ Assuming no change in taxes between 1913 and 1914, and subtracting the sum of these items from the total value of farm products given above, we find the index of the amount available for direct expenditure from farming income by operators and owners in 1923 to have been 142.3 on the basis of 1913. Deflating this index number by the wholesale price index of all commodities we find an index of the ability to make direct purchases in 1923 amounting to 92.4.

Neither of these indexes separates the personal purchasing power of the farmers themselves. To arrive at a satisfactory index of this latter it is necessary to subtract all current operating expenses, as well as taxes and interest, from the total income.

NATIONAL FARM EXPENSES

Comprehensive data on the national farm expenses, unfortunately, are not available for a series of years reaching

²³ *Agriculture Yearbook*, 1923, chart on p. 8.

²⁴ *Crops and Markets*, Supp., August, 1924, p. 286.

²⁵ National Bureau of Economical Research, *Income in the United States*, pp. 54 and 303.

back to prewar days. The Department of Agriculture has recently made estimates for the last five years. Even these lack sufficient explanation to render them of the maximum value for our use. It is possible, however, to estimate the amount in 1923 and in 1913 of approximately 90 per cent of the total gross expense. It is also possible to make a fairly close estimate of the weight which each bears of the total national farm expense.

The basis for our weighting of the influence of each item in the total expense will be based on the summary of 16,183 farm reports made to the Department of Agriculture for the year 1923.²⁶ In some cases the proportion of the expense held by certain items in this summary is higher than appears to be proper in an average for the whole country in the light of other evidence. Corrections have been made accordingly. The final conclusions show that after taking the cost of feed and feeders from the total, the remaining disposition of income was divided as follows: seed, 2.25 per cent; fertilizer, 3.4 per cent; machinery, 6.25 per cent; hired labor, 10 per cent; operator and family labor, 49 per cent; and taxes, 7 per cent. The remainder is taken up by miscellaneous expenses and interest on investment.

One of the very largest items of farm expense is already provided for when the income data used exclude the feed consumed by animals and include only the net sales of livestock. All expense for feed and feeders is thus provided for, excepting the cost of getting these commodities from one farm to another when such farm to farm transfers are made. These marketing expenses are a proper expense item in the national farm accounts. Transportation costs are the large item here. The index of transportation costs for agricultural

²⁶ *Crops and Markets*, Supp., July, 1924, p. 221.

products for 1923 stood at 158.6.⁶ Most of the other marketing charges are on the commission basis and should be low since the prices of farm products have been low. The only light on the amount of such movement is the data on feeder shipments. Complete data on such shipments are not available before 1917. No upward trend is apparent since that year. It seems safe, accordingly, to assume that the total cost of such marketing services has followed quite closely to the changes in the total agricultural income.

The expense for seed is not written off in the farm income data given above. The farm price of seed can be assumed to follow the farm price of crops. As we have already seen, the farm crop price index derived from the income data stood at 152 in 1923. The area devoted to the chief crops increased by 5 per cent in the decade. Accordingly, the index of expenditures for seed in 1923 may be placed at 160, the expenditure in 1923 at \$274,590,000 and \$171,618,000 in 1913.

The expense for fertilizer is a negligible item on the western farms. In the East and South, however, it is an appreciable factor. The index of fertilizer prices at wholesale was 110 for 1923. These are not prices at the farms, but they do involve the element of transportation charges. Since there is evidence that profits have been hard to get in selling to the farmers in recent years,²⁷ it is quite improbable that marketing costs in fertilizer and machinery are particularly high. Any

possible under-estimate of expense in this direction for fertilizer will be offset by an over-estimate in the case of machinery where the index of wholesale price is high.

The increase in quantity of fertilizer purchased was negligible in the decade, although the actual plant food per ton of the fertilizer did increase noticeably.²⁸ The increased expense in fertilizer purchase in the decade may be estimated at 10 per cent. The total expense for fertilizer will be taken as \$414,936,000 in 1923 and \$373,443,000 in 1913.

A fairly close estimate can be made of the change in the expenditure for agricultural implements and machinery. During the years 1918 and 1919 the production and domestic sale of such equipment is reported by the trade as being subnormal. By 1920 it had risen to unusually high proportions. In 1920 the railways of the United States moved 3,323,921 tons of "agricultural implements and vehicles other than automobiles." In 1921 the figure fell to 1,666,536. In 1922 it was 1,719,680 and in 1923 it was 4,598,382 tons.²⁹ Officials of the International Harvester Company estimate that the unit prices in 1923 averaged 68 per cent higher than in 1914.³⁰ These figures in themselves indicate an agricultural purchasing power amazing in the light of the popular conception of the continuation of the farm depression into 1923.

In 1923 the estimates of the Department of Commerce show a domestic sale by manufacturers of such equipment amounting to \$311,823,230.³¹ Similar data for 1913 are not available. The census showed a value of \$164,086,835 for such manufactures in 1914.

⁶ See p. 8.

²⁷ A recent issue of the *Standard Daily Trade Service*, published by the Standard Statistics Company, shows a deficit of .75 per cent in the case of fertilizer companies and a net profit of only .75 per cent in the case of farm machinery companies, as compared with an average profit in a large group of industrials of 6.5 per cent on the investment for the average of the last three years.

²⁸ P. 265, *infra*.

²⁹ I. C. C., Railway Statistics.

³⁰ Everson, J. A.: *Farm Equipment Prices*.

³¹ Department of Commerce, Press Release, October 16, 1924.

In that year the exports amounted to \$21,649,523. These data are not absolutely comparable, nor do they definitely show prices at the farm. They indicate, however, that the farmers spent 118 per cent more for agricultural machinery and implements in 1923 than in 1914. Since the small purchase in 1921 and 1922 and the larger purchase in 1920 offset each other in their effect upon the stock of machinery on hand at the beginning of 1923, we shall not encounter a large error from the puzzling question of the use of machinery owned at the beginning of the two years in question. The figure of 118 per cent increase may be assumed to apply without great error to the expense of the machinery and equipment item.

Automobiles and trucks are not included in the foregoing. Prices on Fords in 1923 were 62.7 per cent of the 1913 level.²² It is certain that the use of this type of machinery has increased greatly, but only 30.7 per cent of farms reporting had autos, and 2 per cent had motor trucks in 1920.²³ A large portion of the expenditure for cars is for the personal use of the farmers, including personal shopping as well as pleasure. A great amount of the business expense is properly chargeable to marketing costs and, consequently, should strictly speaking not be charged against the income based upon prices at the farms themselves. However, it doubtless is a fact that the use of automobiles has helped the strictly farming business and that increased costs in this direction have saved other costs. Certainly the increased amount of the business use of cars has fully offset the comparative decline in their price and the price of gasoline. To be conservative we may assume that the

expenditure for this type of machinery has followed the trend of that for other farm machinery noted above.

Costs connected with machinery and other equipment have been estimated at 6.25 per cent of the income in 1923. On that basis this expense was \$762,748,000 in 1923 and \$334,539,000 in 1913.

Labor expense takes a large share of the total farm income. These labor charges appear in two forms: wages for hired labor, which must be paid before the operators' income can be determined; and the value of the labor of the operator and his family, which must be counted before the cost of farm products can be estimated. The latter item is decidedly the larger on the typical American farm.

The index of farm wages, recently constructed by the Department of Agriculture, stood at 155 for the year 1923.²⁴

The amount of labor used on the farms is a matter on which we need more certain knowledge. Unfortunately, for this purpose, the census was taken at an earlier date this last time than in 1910. The results show a total of 10,953,158 employed in "agriculture, forestry and animal husbandry" in 1920 against 12,659,082 in 1910. The main decrease was in the hired laborers. Comparisons between the census estimates of the total amount paid for wages in 1909 and 1919 and the Department of Agriculture estimates of farm wage rates lead us to question if there was any serious decline in laborers during the period. There are many indications that there have been heavy migrations from the farms both during and since the war. There is no proof, however, that the total agricultural population has declined. Data of the Department indicate that the supply of farm labor was fully as short

²² Ford, Henry: *My Life and Work*. Also recent quotations.

²³ Abstract of the 14th Census, p. 748.

²⁴ See p. 8.

in 1923 as in 1919. We shall adopt the conservative conclusion that probably the number of laborers has remained about constant during the decade and that post-war declines have offset any slight increase in farm operators up to 1919.

On this basis the expense for hired labor, which we estimate at approximately \$1,220,400,000 in 1923, was \$787,355,000 in 1913. The allowance for operator and family labor in 1923 would be \$5,979,960,000 and \$3,858,038,000 in 1913.

Estimates have already been given for tax payments and interest on mortgages and bank loans in the two periods. It is necessary also to make an estimate of the interest on the total investment, including that part of the owners' equity which is actually based upon the business of farming. Since land values are still above prewar levels, and since before the war a material portion of the land prices was based upon speculation, it will be necessary to make allowances for this. The Department of Agriculture estimates the total value of farm property, including working capital in 1923 at \$59,409,000,000.³⁴ The National Bureau of Economic Research puts the figure for 1913 at \$45,227,000,000.³⁵ According to the census about 70 per cent is land value and 14.6 per cent buildings. We shall assume that one-half of this latter belongs to the personal dwelling. To the extent to which this is a business investment there are offsets in other items of investment, such as autos, which are personal investment. We shall exclude 7.3 per cent of the total capital entirely as being devoted to personal rather than business purposes. The remainder other than land is allowed an inter-

est of 5 per cent. The value of the land is allowed an interest rate of 3.5 per cent. This is the average rate of rental charge and is the competitive rate paid for the use of the land in production.³⁶ Its use to represent the interest on land eliminates the influence of the speculative portion of the land value in so far as this is possible. The changes in the major items of expense are thus accounted for. Since there has never been any census of total farm expenses, we shall not attempt to cast up an actual balance sheet for any year's operations. All national farm balance sheets which have been estimated by various statisticians have evidence of a larger probable error than the margin left for profit. It does not seem that there is sufficient exact evidence as to the proportion which each and all of these expense items bears to the total income to warrant any definite conclusion as to the net profit. However, the evidence is not so weak as an index of change in the separate items and total expense from one year to another. The "miscellaneous" items are always a matter of guess. We have presented no data regarding them and shall assume that the trend in the major known expense items portray the trend for the sum of all items. We shall venture, accordingly, to disregard the expenses as absolute figures and present the estimates of the change in these items and their various totals on the basis of relations.

The operating expenses of farming, including wages assigned to the operators and their families as well as hired labor, show an index of 161.7 for 1923 when taxes are included and 156.6 when taxes are excluded. These compare slightly unfavorably with the index of total farm income which was 156.2.

The complete business status of farming appears when all operating

³⁴ *Crops and Markets*, Supp., August, 1924, p. 286.

³⁵ National Bureau of Economical Research, *Income in the United States*, p. 63.

³⁶ Gray, L. C.: *Agricultural Economics*, p. 252.

expenses and fixed charges are considered. Including operator and family labor in the operating expenses and using the interest charges explained above on the total business investment, we find an index of such total costs in 1923 of 155.3. The probable error in the comparison is such that it is unwise to emphasize this small apparent improvement in position. It is plain, however, that farming as a business in 1923 did not compare unfavorably with its situation in 1913.

It is interesting in passing to note that when this cost index of 155.3 is compared with an income index of 156.2 and a general price level of 154, and when we call to mind the fact that the quantity of agricultural production has increased materially, it must be concluded that the increased production in the decade has been accomplished with a marked decrease in cost per unit of product.

The comparative status of the whole population engaged in agriculture is shown by the trend of expenses excluding the labor items and interest other than payments on mortgages and bank loans. Such expenses rose to 224.1 in 1923 when taxes are included, and to 217 when taxes are excluded. It is assumed here that all interest on non-mortgaged land accrued to the benefit of the farmers. The less safe assumption that mortgages are held only by outsiders, unfortunately, cannot be avoided. These conclusions indicate that the farming population as such had an income with which to pay for personal expenses and taxes amounting to 146 in 1923 as compared with 100 in 1913. We lack an index of cost of living on farms with which to compare this to estimate the purchasing power of the farming population. The use of the Bureau of Labor Statistics' index number of the retail cost of food, which also stood at 146 in 1923, would prob-

ably misrepresent the situation. It also is fruitless to attempt to compute an index of the purchasing power of farm wages.

The status of the owners and operators as such is shown by comparing the total expenses paid by such operators with their total income. These expenses include all known items excepting interest on the personal equity of the owners and operators and wages assigned to the operators and their families. Such expenses rose to the relative figure of 199 in 1923. When comparisons are made with the total income it is apparent that the index of the income accruing to this class was 138.6 in 1923. No attempt will be made to isolate the item of rent and make separate showings for the various farming groups other than the hired laborers.

It is thus apparent that the purchasing power of the business of agriculture had returned to normal by 1923 but that, owing to high taxes, interest charges and other expenses, the position of the people engaged in farming was, as a whole, depressed. The laborers fared better than the farmers themselves. The farmers, themselves, on the average were still suffering from much poorer returns from actual farming operations than in 1913. Moreover, up to 1920 they had been enjoying an increase in their land value amounting to about 2 per cent a year.³⁷ This speculative situation has been reversed and in the place of a gain a very real decline is going on in nominal land values.

A great deal of the trouble in the average situation comes from the untypically bad situation in the western section where farming was pushed beyond the true "extensive margin" at the end of the war. It is quite apparent, in view of the ability of the

³⁷ Gray, L. C.: *Agricultural Economics*, p. 253.

old lands to produce all food needed at present, even at decreasing costs, that the expansion onto these new poorer lands was not justified. The country has made a very expensive mistake by over-rapid expansion of the farming area in these regions. How much of the trouble is localized in this western area would be difficult to determine, but conditions there are so bad comparatively that were the data for that section taken from the national average it is safe to say that the remainder would show a good degree of prosperity for all the well-directed agricultural efforts.

The year 1924 will certainly show an improvement over 1923. The records are not yet sufficiently complete to warrant an attempt to bring the foregoing data for 1923 up to date. However, such material as is available would indicate the probability that sufficient improvement has taken place to bring even the actual income of the operators up to a prewar purchasing power. If the final reckoning for the year supports this preliminary estimate, it may be said that the prosperity of the business of agriculture has returned to a reasonably high level.

The Purchasing Power of the Farmer's Dollar From 1913 to Date

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THE farmer's dollar will buy, of course, exactly as much as anybody else's dollar—once he gets it. It would be more strictly accurate, therefore, to talk about the purchasing power of the farmer's products. However, the "dollar" form of expression is the popular one and nobody is likely to misunderstand that the discussion herein relates to the general position of agriculture as reflected by the exchange value of its products.

The past ten years have had somewhat the same bearing on agricultural history as an earthquake has upon geologic history. All those economic processes which normally spread themselves over long periods of time and occur in mild degree were precipitated by the war period as sudden, violent phenomena.

From the late nineties down to 1913, the period had been one of slowly rising prices. That was a chapter of

agricultural stabilization, of gradually improved production, of increasing property values, of moderate farm prosperity. During this time agricultural products exchanged for industrial products and services on a plane of comparative stability and slowly increasing advantage.

With the advent of the war in 1914, a new chapter opened. The first shock of war merely sent the price structure into violent fluctuation: wheat prices, for example, abruptly went up while cotton just as abruptly went down. By 1916, however, the situation had crystallized and prices had really begun to mount. Thus continued for four years the feverish experiences of wartime: an unending pressure for greater production, soaring price level, expansion, finally inflation and widespread speculation. During 1917, 1918 and 1919, farm products sold at relative advantage. Those three years constituted the major

THE PURCHASING POWER OF FARM PRODUCTS IN TERMS OF NON-AGRICULTURAL COMMODITIES
1913 = 100



wartime period of exchange favorable to agriculture.

Then, in 1920, came the smash. Deflation pricked the balloon and drastic curtailment of consumption, both here and in Europe, squeezed it limp. Prices collapsed. Raw materials and especially farm products suffered severely; prices of those commodities fell first, hardest and farthest. The exchange value of the farmer's products sank to such depths of disparity as to render his situation one of national concern.

EXCHANGE POSITION OF FARM PRODUCTS

In recording the relative exchange position of farm products, there are several angles from which measurement might be made. One way would be to simply make comparisons between the ratios of farm receipts to expenses, one year with another. A difficulty here-in lies in the lack of adequate data over any length of time. Another way would be to subtract from gross farm income the amounts of taxes, interest and fixed charges and let the balance represent buying power for all other goods and services during a given

year. Another way is by straight comparison of unit prices.

The farmer sells all his labor in the form of his products. The prices of his products are, therefore, a sensitive gauge as to his status in the general markets. While they do not measure the actual proportions of income, nevertheless the fluctuations in price of a unit of farm products, when set off against the fluctuations in price of a unit of products bought by farmers, give a fairly reliable index of relative position from time to time. The actual figure representing purchasing power at a given time may be only approximately indicative, but the trend over a period is accurately reflected and the latter is the significant thing.

Table I shows the index numbers of prices, at the farm, of 30 agricultural products. This is the "new" price index of the Department of Agriculture and is somewhat more comprehensive than the price index which the Department previously used. It is constructed on a five-year base, August, 1909, to July, 1914, but by a coincidence the year 1913 equals 100 and is so taken here:

TABLE I—INDEX NUMBERS OF PRICES OF FARM PRODUCTS
1913=100

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
January.....	95	104	100	104	140	194	200	219	135	114	134	134
February.....	96	105	101	106	148	197	194	221	128	118	136	134
March.....	97	104	100	108	159	199	197	222	123	123	136	128
April.....	98	104	102	110	176	200	207	230	115	123	137	128
May.....	98	104	104	111	188	198	215	235	112	127	135	127
June.....	99	104	101	112	188	196	216	234	110	128	133	128
July.....	99	103	99	113	185	197	222	224	111	126	130	130
August.....	101	104	97	117	183	203	222	209	116	120	128	137
September.....	103	102	97	123	184	207	208	194	118	119	130	129
October.....	104	98	101	128	187	204	206	178	120	123	132	136
November.....	104	96	99	137	187	200	209	158	116	126	133	..
December.....	103	97	100	139	191	201	212	140	115	131	135	..

Table II shows index numbers of prices, at wholesale, of non-agricultural commodities. This is the "all commodities" index of the Bureau of

Table III shows the purchasing power of farm products in terms of non-agricultural commodities. It is obtained by dividing each index num-

TABLE II—INDEX NUMBERS OF WHOLESALE PRICES OF NON-AGRICULTURAL COMMODITIES
(Bureau of Labor Statistics "all commodities," excluding farm products and food)
1913 = 100

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
January.....	102	94	91	116	160	172	184	227	188	150	170	160
February.....	102	96	92	120	163	175	181	234	178	149	172	162
March.....	102	96	93	126	167	179	180	240	171	150	175	161
April.....	102	98	94	128	172	183	180	250	166	153	176	159
May.....	101	96	95	129	180	186	182	250	162	161	172	157
June.....	99	95	96	132	187	187	191	246	158	164	168	155
July.....	100	93	96	129	194	191	198	246	152	172	165	154
August.....	99	94	98	128	190	192	204	242	150	176	163	154
September.....	101	96	100	132	185	194	205	240	149	170	164	153
October.....	99	90	100	137	172	192	206	228	152	169	161	153
November.....	97	90	103	148	170	192	210	210	152	169	160	..
December.....	96	91	110	156	170	188	215	197	152	168	158	..

Labor Statistics, from which farm products and food have been excluded.

Farmers actually buy their required articles at retail, but reliable data on such retail prices are not yet available. The next best thing to use as basis for comparison is this wholesale price series of non-agricultural commodities here given above.

ber in Table I by that for the corresponding month in Table II. (See Table III below.)

Table IV shows relative purchasing power, during September, 1924, of 10 principal agricultural products in terms of certain groups of industrial commodities. The former are based on United States average prices at the farm.

TABLE III—THE PURCHASING POWER OF FARM PRODUCTS IN TERMS OF NON-AGRICULTURAL COMMODITIES
1913 = 100

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
January.....	93	111	110	90	88	113	109	96	72	76	79	84
February.....	94	109	110	88	91	113	107	94	72	79	79	83
March.....	93	108	108	86	95	111	109	92	72	82	78	80
April.....	96	106	109	86	102	109	115	92	69	80	78	81
May.....	97	108	110	86	104	106	118	94	69	79	78	81
June.....	100	109	105	85	101	105	113	95	70	78	79	83
July.....	99	111	103	88	95	103	112	91	73	73	79	84
August.....	102	111	99	91	96	106	109	86	77	68	79	89
September.....	102	106	97	93	100	107	101	81	79	70	79	84
October.....	105	109	101	93	109	106	100	78	79	73	82	89
November.....	107	107	96	93	110	104	100	75	76	75	83	..
December.....	107	107	91	89	112	107	99	71	76	78	85	..

The latter are the Bureau of Labor Statistics groups of commodities at wholesale.

This gives an idea of the relative status of certain important key products this fall. It reflects the current relatively strong position of wool and cotton producers; the depression in which cattlemen are engulfed; the disparity which is just now pulling

price level is less important than that his products exchange on a par with others.

There is one important case, however, wherein he is concerned with the absolute level of prices. About 20 per cent of all farm expenditure is for taxes and interest. The exchange value of agricultural products in terms of taxes and interest is now so low as

TABLE IV—RELATIVE PURCHASING POWER
(At September, 1924, Farm Prices)
1913=100

IN TERMS OF	OF A UNIT OF									
	Cotton	Corn	Wheat	Hay	Potatoes	Beef cattle	Swine	Eggs	Butter	Wool
All commodities.....	120	124	98	77	84	63	76	111	95	143
Cloths, etc.....	96	100	79	62	68	51	61	89	76	114
Fuel, etc.....	116	110	87	68	75	56	68	98	85	127
Metals, etc.....	140	145	114	90	99	73	89	129	111	166
Building materials.....	105	108	85	67	74	55	67	96	83	125
House-furnishing goods..	105	108	85	67	74	55	67	96	83	125

the Corn Belt away from hogs and into corn; the return nearly to par of the Wheat Belt; the rather unfavorable situation of hay and potato growers.

In so far as the farmer's financial outlay is for goods and wages, his chief concern is that there be no disparity between prices of his products and those of other things. The general

to be a very serious matter in parts of the United States. If the general price level should continue to decline, it would lay increasing handicap upon the men who are obliged to meet obligations contracted when prices were higher—that is, when dollars were more numerous. The relationship to the prewar status is indicated in Table V.

TABLE V—RATIO OF FARM PRODUCT PRICES TO TAX AND INTEREST PAYMENTS

Year	*Total Farm Tax and Interest Payment (Millions)	Index Numbers of Tax and Interest Payment	Index Numbers of Prices of Farm Products	Ratio of Prices of Farm Products to Tax and Interest Payment
1914.....	\$755	100	100	100
1920.....	1,457	193	201	104
1921.....	1,684	223	114	56
1922.....	1,749	232	122	53

*See Yearbook U. S. Department of Agriculture, 1923, p. 8.

IN CONCLUSION

To sum up, the exchange position of agricultural products was moderately favorable to farmers in the years immediately preceding the war. Compared with the year 1913, their indicated purchasing power was relatively high in 1914; sank below par in 1915 and continued so during 1916; rose above par in the summer of 1917 and continued relatively high during 1918 and 1919; plunged to serious depths in the spring of 1920 and has continued low since that time. The trend has been one of slow improvement during the last two years but the situation, as it stands, still spells serious handicap to agriculture. It is particularly severe on that generation of younger men who, by reason of having been born at

a certain time, arrived at the status of farm ownership during the period of inflated prices and are now struggling with a load of taxes and interest which has even increased as the dollars wherewith to pay have become scarcer.

Judged by prewar conditions, it appears that the net effect of the period from the beginning of the war to the autumn of 1924 has been adverse to agriculture as a whole. The most significant material effects so far are a general deterioration in the farm productive plant, and a redistribution of farm population. The ultimate effects will include a decline in per capita production to the point of forcing a restoration of farmer purchasing power and another general readjustment in the relationships between agriculture and urban industry.

Income from Agricultural Production

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IT is the purpose of this paper to discuss the changes that have taken place in income from agricultural production during the past fifteen years and to analyze especially the changes in post-war agricultural income.

Recent data published by the Department of Agriculture together with the income studies of the National Bureau of Economic Research furnish the basis for a broad survey of agricultural income before, during and after the war. From the two studies it is possible to estimate the changes that have taken place in:

- (1) The rate of return on all capital employed in agriculture;
- (2) The rate of return on the capital owned by all farm operators (owners and tenants) as distinguished from the capital owned by non-farmers;
- (3) The rewards for the operator's labor, risk and management;
- (4) The distribution of the operator's income.

These phases of agricultural income will be discussed in turn.

THE RELATION TO NATIONAL WEALTH AND INCOME

It is necessary, at the outset, to have in mind the relation of agricultural wealth and income to the wealth and income of all industries. The question often arises, does agriculture earn its fair share of the national income? The answer must, of course, depend on a definition of "a fair share." Should "a fair share" for agriculture take into account the fundamental differences between agricultural and other

industrial enterprises? Should one, for instance, take into account (a) the average investment per person engaged in agriculture and the average investment per person engaged in other industries, or (b) the relative amount of labor and managerial services contributed to the national output by the average person engaged in agriculture and the average person engaged in other enterprises, or (c) the portion of national wealth represented by agricultural wealth? It is obvious that attempts to answer these questions would lead into controversial fields. It is, however, of some value to note the available meager data on the latter of these criteria of "a fair share," namely, the relation of national agricultural wealth and income to total national wealth and income.

During the past quarter of a century our national wealth, as estimated by the Bureau of the Census, increased from 88.5 billion dollars in 1900 to 186.3 billion in 1912, and to 320.8 billion in 1922 (Dec. 31). In these intervals the value of all agricultural property increased from 22.1 billion dollars in 1900 to 49.8 billion in 1912, and to 64.3¹ billion in 1922. Expressed as

¹ For these comparisons an estimate has been made of the value of farm land and buildings and subtracted from the original Census Bureau estimates of real property and improvements taxed. The estimated value of land and buildings is on the basis of the agricultural census returns adjusted according to changes in land values as reported by crop reporters to the Department of Agriculture. The 1922 value of agricultural wealth includes an estimate of \$1,700,000,000 valuation of autos and trucks on farms and \$500,000,000 valuation of farm products on hand.

percentages of total national wealth these estimates for agriculture are respectively 25 per cent, 26.7 per cent and 20 per cent. The decline in the relative position of agriculture from 26.7 per cent of the total wealth in 1912 to 20 per cent in 1922 is due almost entirely to the deflation in the values of agricultural real estate and equipment.

The contribution that agriculture makes to the total national income is indicated by the studies of the National Bureau of Economic Research. In the five years preceding the war, when agriculture represented 26.7 per cent of total national productive wealth, it contributed only \$5,391,000,000, or 16.8 per cent of the total national income of \$32,173,000,000. With the exception of the factory group, which produced 21.4 per cent of the total national income, agriculture was the largest contributor. In 1919, the last year for which Dr. W. I. King's estimates are available, agriculture produced \$14,835,000,000, or 22.8 per cent, of a total for all industries estimated at \$65,000,000,000. Agriculture's share of the national wealth for that year has not been estimated, but it was only 20 per cent in December, 1922. It seems possible, therefore, that agriculture in 1919 earned a share of the national income approximately equivalent to its share of the national wealth.

Whether agriculture today is earning a share commensurate with the portion it represents of national wealth is not ascertainable. There can be little doubt, however, that the "equilibrium" reached about 1919 was upset by the precipitous decline in commodity prices and by the continued spread between agricultural and non-agricultural prices. There is sufficient evidence in studies of post-war agricultural earnings to indicate that the relationship between

capital investment and income has undergone considerable change.

RATE OF AGRICULTURAL EARNINGS

In the five years immediately preceding the war, earnings from agriculture as a whole were sufficient to yield approximately an average return of 4.5 per cent for capital and management, in addition to paying the major operating expenses and a hired-hand wage allowance for the physical labor of the operator and his family. In 1918 and 1919 capital earnings reached 11 per cent but were practically wiped out during the depression in 1920-21. Since then they have reached 3.1 per cent. It is obvious from the following table that, except for the years 1916-19, the earnings for capital and management have generally been below the current commercial rates of interest. At this point it should be observed that the rates shown in Table I, (p. 29) are based on current values of agricultural capital and on relatively high valuations during the war. They are therefore lower than they would be if based on prewar valuations. If these earnings were computed on valuations adjusted to 1910-14 farm property values, the highest average return during the war period would not exceed 17.5 per cent. Even on this prewar basis the rates earned on agricultural capital do not appear high in comparison with the profits secured during the war by many other industries operating on a "cost plus" basis.

In comparing these returns on agricultural property with the rates of return earned in other industries two additional facts need to be borne in mind. The returns on agricultural property include the rewards for both capital and the managerial services contributed by the farmers. On the other hand, they represent returns in

TABLE I—RATES OF EARNINGS ON ALL AGRICULTURAL CAPITAL AND MANAGEMENT, 1909-1923

Calendar Year	Total Value of Farm Property January 1*	Gross Income†	Net Income Available for Capital and Management‡	Rate Earned on Total Farm Property
	1,000,000 Dollars	1,000,000 Dollars	1,000,000 Dollars	Per Cent
1909.....	40,059	5,005	1,427	3.6
1910.....	41,400	6,112	2,451	5.9
1911.....	42,225	5,772	1,926	4.6
1912.....	42,917	5,791	1,759	4.1
1913.....	45,227	6,336	2,261	5.0
1914.....	46,619	6,507	2,469	5.3
1915.....	48,199	6,822	2,757	5.7
1916.....	52,687	7,800	3,313	6.3
1917.....	57,110	10,505	4,853	8.5
1918.....	64,122	13,713	6,832	10.7
1919.....	71,848	16,111	8,021	11.2
1920.....	78,707	11,153	1,980	2.5
Crop year§				
1919-20.....	79,607	15,830	4,954	6.2
1920-21.....	73,872	12,782	438	0.6
1921-22.....	63,664	9,552	865	1.4
1922-23.....	61,594	10,592	1,916	3.1
1923-24.....	59,409	11,467	1,863	3.1

* Includes allowance of 1 per cent of inventory for cash working capital.

† 1909-20, Dr. W. I. King's estimates of income from agricultural production before deducting operating costs. Income in U. S., II, p. 55.

‡ 1909-20, Dr. W. I. King's estimates of total returns to all farm property owners reduced by a wage allowance for the estimated number of farmers.

§ U. S. Dept. of Agriculture, Crops and Markets Supp., August, 1924.

addition to the house rent furnished by the industry to the farm operators.²

² The data in Tables I and III for the calendar years 1909-20 are taken from Income in the U. S., II, Nat'l Bureau of Economic Research, and for the past five crop years from Crops and Markets Supplement, Aug., 1924, U. S. Dept. of Agriculture. The two studies followed in general the same procedure. Income values are based on the value of production less feed and seed requirements. The values of the Department of Agriculture are based on prices received by farmers during the marketing season, weighted by the portions marketed each month. Other differences appear in the number of items included in business expenses. The study of the Department of Agriculture included property taxes as an operating cost. On the other hand, the National Bureau of Economic Research included interest paid on bank credit, which in the former study was handled as one of the returns on borrowed capital. In the aggregate results, the

The rates of earnings shown here on all farm capital are subject to other important limitations. In the first place, they show merely average conditions from year to year for an industry of more than six million independent farm enterprises and take no account of the fact that some farmers or branches of the industry at any given time were in a better or worse position than the average. Secondly, the rates in Table I relate to all agricultural capital irrespective of ownership. Prosperity and depression do not

differences do not appear large, as indicated by the fact that an average for the two calendar years 1919 and 1920 gives approximately the result obtained for the crop year 1919-20 by the Department of Agriculture.

affect all owners of farm property to the same degree. Income on capital invested in farm mortgages, or in farms rented out on a share or cash basis to farm operators, is fairly constant and certain compared with the fluctuations in the earnings on the farmer's own capital. It is therefore highly important to observe how agricultural conditions of the past five years affected the earnings of the farm operator's own capital as distinguished from that of non-operators.

INCOME RATES EARNED BY FARM OPERATORS

In its study of income from agricultural production for 1919-24 the Department of Agriculture distinguished between the share of income retained by farm operators and that paid to non-operators. Among operators it included all farmers, tenant as well as owner-operators, and among non-operators it included all owners of agricultural property not actively engaged in farming.

In order to obtain the portion of the total income applicable to the farmer's

own capital investment in agriculture, the study divides all agricultural property into three groups: (1) capital owned by operators, (2) capital rented from non-operators, and (3) operator-owned property encumbered by mortgage and other indebtedness. Item 1, the current value of the operator's net capital investment in agriculture, is obtained by deducting items 2 and 3 from the estimated current value of all agricultural capital. This distribution indicates that of the total farm property in 1920, valued at 79.6 billion dollars, operators owned 48.5 billion, or 61 per cent. In 1924, the total capital investment was valued at 58.4 billion, of which operators owned 33.4 billion, or 56 per cent. The rates earned on all capital and the rates received by the various owners are shown in Table II.

It is immediately obvious that the rates paid on mortgage and other indebtedness, and on rented farms, are relatively constant. A large portion of farm indebtedness is in the nature of long time obligations and necessarily forms a prior claim on income. In

TABLE II—RATES OF RETURN EARNED ON ALL CAPITAL AND RATES RECEIVED BY THE VARIOUS OWNERS OF CAPITAL

Year	Rate Earned on All Capital Invested in Agriculture*	Rate of Interest Paid on Mortgage and Other In- debtedness	Rate Paid on Value of Cash and Share- Rented Prop- erty†	Rate Earned on Operator's Net Capital Invest- ment‡
	Per Cent	Per Cent	Per Cent	Per Cent
1919-20.....	6.2	6.7	8.3	5.8
1920-21.....	0.6	6.8	7.7	-3.1
1921-22.....	1.4	6.8	5.7	-1.4
1922-23.....	3.1	6.8	6.3	1.5
1923-24.....	3.1	6.8	6.7	1.4

* After paying all operating expenses, including taxes, and allowing a wage to operators.

† Estimates of the Division of Land Economics.

‡ After paying all operating expenses, including taxes, and allowing wages to operators. Operators' net investment in agriculture is property actually owned, excluding that which is rented from non-farmers and that which is encumbered by indebtedness.

1919-20, net income available for capital (for estimated amounts see Table I, p. 29) was somewhat over 6 per cent in addition to a wage allowance for the operator's labor. In the following year capital earnings represented a return of less than 1 per cent on the entire investment but not sufficient to pay interest on indebtedness and rent on rented farms. If these obligations were met, the actual operators must have drawn on their cash and credit reserves or received less than the hired-hand wage allowed them for their labor. Practically the same conditions existed in 1921-22. In the past two years, however, in addition to a labor wage allowance for the farm operator and payment of more than 6 per cent on borrowed capital, income from agriculture was sufficient to allow a 1.5 per cent return on the operator's own capital.

The losses sustained in capital earnings in 1920-21 and 1921-22, and the low inadequate rates during the past two years, were not the only losses sustained by agriculture. It has been pointed out that agricultural inventory values declined from 79.6 billion dollars in 1920 to 59.4 billion in 1924. In calculating the yearly income from agricultural production these losses on inventory were not included. For the most part they represent merely paper losses, but in many cases they represent actual losses, particularly to those farmers who bought at high values and were forced to sell out during the depression at deflated values.

THE FARMER'S REWARD

The preceding comparisons dealt entirely with the returns on agricultural capital, the returns being obtained by deducting from gross income all operating costs and a wage allowance for the physical labor contributed by the farm operator. We may now indicate the

rewards for the farmer's labor, risk and management, by deducting from income a current interest return on capital. The balance distributed over the estimated number of farm operators represents the individual farmer's reward. The results appear in Table III.

In Dr. King's estimates for 1909-1920 all capital was allowed a return of 5 per cent for all years except 1919 and 1920, when the rate was changed to 5.5 per cent and 6.5 per cent respectively. In the calculations of the Department of Agriculture for 1919-24, borrowed capital (mortgaged and rented) was allowed a rate of return ranging between 6 and 7 per cent, and the farmer's own capital a rate of approximately 4.5 per cent. It is evident that the two studies give comparable results though differing somewhat in methods used. The average of Dr. King's estimates of reward per farmer for 1919 and 1920 is \$965, which compares with \$932, the crop year average for 1919-20.

The rapid rise in reward for the farmer's labor and management from 1915 to 1919 is obviously due in large part to the uniform rate of 5 per cent allowed on capital. If agricultural capital were allowed the profitable rates earned by other industries during the war, the rewards for the farmer's labor would appear considerably less.

During the five years before the war, the average farm family earned \$396. In 1918 and 1919 this amount increased to more than \$1,200 but declined during the depression of 1921-22 to \$292, this being the lowest return during the past 15 years. Since then it has exceeded the prewar average of \$396 in both years, 1922-23 and 1923-24.

The real value of the returns for the farmer's physical effort and managerial services has been surprisingly low. The highest earnings during the war, \$1,466, had a value of only \$737 in exchange for non-agricultural commod-

TABLE III—AVERAGE EARNINGS OF FARMERS FOR LABOR, RISK AND MANAGEMENT COMPARED WITH FARM-HAND WAGES, 1909-1923

Calendar Year	Reward per Operator (Including Family Labor)*	Wages, Without Board, per Year Paid to Hired Farm Labor	Index of Prices of Non-Agricultural Commodities† (1910-1914=100)	Real Value (if Exchanged for Non-Agricultural Commodities) of—	
				Reward per Operator	Wages Paid to Hired Farm Labor‡
	Dollars	Dollars		Dollars	Dollars
1909.....	311	329	...	...	...
1910.....	462	330	102	453	324
1911.....	392	345	96	408	359
1912.....	372	355	100	372	355
1913.....	444	364	104	427	350
1914.....	459	359	97	473	370
1915.....	495	362	101	490	358
1916.....	586	394	138	425	286
1917.....	903	485	182	496	266
1918.....	1,278	586	188	680	312
1919.....	1,466	675	199	737	339
1920.....	465	779	241	193	323
Crop year					
1919-20.....	932	675	226	412	299
1920-21.....	399	779	213	187	366
1921-22.....	292	520	159	184	327
1922-23.....	454	501	177	256	283
1923-24.....	520	563	166	313	339

* Income available per operator after deducting operating costs and allowing interest on capital. Calendar years 1909-20, estimates of Dr. W. I. King, *Income in the U. S.*, II (p. 63); crop years 1919-20 to and including 1923-24, estimates of the Department of Agriculture.

† Bureau of Labor Statistics. 1910-1914=100.

‡ It is recognized that this method of evaluating farm wages does not take into account the fact that the farm laborer's budget is somewhat different from that of the farm operator.

ities. During the depression the buying value of the farmer's earnings dropped to less than \$190, and by the end of the 1923-24 season was still considerably below the real prewar earnings. The average reward of \$520 per farm family in the past year, if exchanged for non-agricultural commodities, could buy only as much as \$314 did before the war. Compared with prewar earnings of \$396, the purchasing power of the average farmer's income for 1923-24 represented 79 per cent of its prewar purchasing power.

The additional comparison in Table III between the farmer's reward and

wages paid to hired labor further emphasizes the inadequacy of agricultural income, particularly during the past four years. During the ten years from 1910 to 1919 the rewards per farm family exceeded the yearly wages paid to farm laborers. Since 1920-21 the average farmer could have obtained a larger income if he had hired himself out as a farm hand.

DISTRIBUTION OF OPERATOR'S GROSS INCOME

The fact that agriculture since the price decline in 1919-20 has not earned sufficient income to allow both a cur-

rent interest return on capital investment and an adequate reward for the farmer's labor and management has, of course, a direct bearing on the welfare of the average farm operator. Table IV has been constructed to show the relationship of agricultural income and its distribution to the farmer's welfare.

Gross income from agricultural production is here distributed from the

point of view of the farm operator. The average farmer pays for hired labor, buys products of other industries with which to operate his business, pays taxes on his own property, rent on borrowed property and interest on debts. The remainder, which constitutes his net income, may be either in the form of cash or products raised for the farm family. In 1919 the aver-

TABLE IV.—DISTRIBUTION OF OPERATORS' GROSS INCOME FROM AGRICULTURAL PRODUCTION, 1919-1924

	1919-20	1920-21	1921-22	1922-23	1923-24
	1,000,000 Dollars	1,000,000 Dollars	1,000,000 Dollars	1,000,000 Dollars	1,000,000 Dollars
Gross income.....	15,830	12,782	9,552	10,592	11,467
Distribution:					
Wages to hired labor.....	1,492	1,730	1,103	1,074	1,208
Paid for products and services of other industries, repairs and main- tenance of buildings and equip- ment.....	3,394	3,603	2,582	2,702	3,018
Taxes on operator-owned investment	388	545	582	617	617
Rent on property rented from non- operators.....	1,706	1,403	959	992	989
Interest on mortgage and other in- debtedness held by non-operators.	707	728	738	748	748
Consumed on farms for family living.	3,416	3,403	2,633	2,700	3,048
Net cash income available for living expenses and other distribution...	4,727	1,370	955	1,759	1,839

DISTRIBUTION IN PER CENT OF GROSS INCOME

	Per Cent 100	Per Cent 100	Per Cent 100	Per Cent 100	Per Cent 100
Gross income.....	100	100	100	100	100
Distribution:					
Wages to hired labor.....	9.4	13.5	11.6	10.1	10.5
Paid for products and services of other industries, repairs and main- tenance of buildings and equip- ment.....	21.4	28.2	27.0	25.5	26.3
Taxes on operator-owned investment	2.4	4.3	6.1	5.8	5.4
Rent on property rented from non- operators.....	10.8	11.0	10.0	9.4	8.6
Interest on mortgage and other in- debtedness held by non-operators.	4.5	5.7	7.7	7.1	6.5
Consumed on farms for family living	21.6	26.6	27.6	25.5	26.6
Net cash income available for living expenses and other distribution...	29.9	10.7	10.0	16.6	16.1

age farmer, after meeting the above necessary costs, had a net income consisting of 21.6 per cent of total income in the form of products for family living, and 29.9 per cent in cash, available for the purchase of those things which affect his standard of living. In the two severest years of the depression, when gross income dropped from 15,830 million to 9,552 million dollars, the available cash income amounted to only 10 per cent of the total. In other words, the farmer not only had fewer dollars to spend but he could spend only 10 per cent of each dollar for clothing, groceries, furniture, education and other items that contribute to the maintenance of a proper standard of living. Since the low point reached in 1921-22, there has been an improvement in farmer's income. In the past two years larger portions of the operator's income were available for family use and for living expenses.

The above distribution of the farm-

er's gross income forms a brief summary of the effect of the post-war depression on agriculture. As in other industries, the primary effect of declining prices was a maladjustment in the relation of costs of operation and income. It will be observed that the major expense items—labor, necessary purchases from other industries, taxes and interest—actually increased in 1920-21, when income had already declined. In that and the following year costs of operation absorbed greater portions of enormously decreased income. The slow improvement in the past two years has given the average farmer a larger share of his income for family living and for purchases toward the maintenance of his standard of living. In the present period of actual and prospective improvement it is to be expected that costs of operation will lag behind and enable the average farm operator to regain some of the losses of the past few years.

Interest and Taxes in Relation to Farm Income

By L. M. GRAVES

Secretary, Howard-Moorhouse, Inc.

AGRICULTURE is a heavily capitalized industry with a low sales turnover and a high ratio of fixed charges to gross receipts, including under fixed charges, contractual interest and direct taxes. With rising land values and increasing commercialization of agricultural production, too, indebtedness and interest charges rise rapidly; and the increase in taxation during the past generation under our system of general property taxes has borne at least as heavily on farmers as on other classes of the population.

In view of these facts the payments on interest and tax account appear as a very important factor in the farmer's economic position. The heavy capitalization and low turnover of agriculture mean a relatively narrow margin of gross income over fixed charges; and any variation in the amount either of income or charges influences in very marked degree the amount left to the farmer to pay operating costs and living expenses.

The burden of fixed charges on agricultural income presents two phases: first, the secular trend—i.e., the long time tendency of the proportion of income absorbed by the charges to rise or fall; and second, the effect of periods of inflation and speculation, such as that from 1916 to 1920, upon the fixed charge ratio.

The long time trend of the fixed charge ratio is of great significance in determining the permanent status and development of agriculture. In this connection farm mortgage indebtedness must be taken as typical of the group, as the only data available over any considerable period are those of

the Census Bureau relating to farm mortgages. The rather fragmentary evidence on this point indicates clearly that the burden of mortgage interest charges tended to decline rather than increase over the thirty year period from 1890 to 1920.

The proportion of owner-operated farms encumbered with mortgages, it is true, increased between 1890 and 1920—being 27.8 per cent in the former year, 37.2 per cent in the latter. The increase was steady from decade to decade. The amount of the debt as compared to the value of the property mortgaged, however, declined from 35.5 per cent in 1890 to 27.3 per cent in 1910, rising in the next decade to 29.1 per cent. Thus in spite of the increase during the boom period preceding 1920 the owner-operator equity was proportionately greater at that date than thirty years earlier. If mortgages on rental farms be allowed for, the total indebtedness increased at practically the same rate as the value of land and buildings.

MORTGAGE INDEBTEDNESS

A comparison of mortgage interest charges with farm income also shows a declining interest burden. Interest payments on all farm mortgages—including both owner-operated and rented farms—between 1890 and 1910 increased about 100 per cent, while farm income rose 105 per cent. By 1920 the interest payments had risen to 470 per cent of the 1890 base, farm income to 520 per cent. This was at the peak of farm prosperity. Taking the average of the three years, 1918 to 1921, however, there still is shown a favorable

ratio of increase. Interest payments for these years averaged about 460 per cent of 1890, income 475 per cent.

From 1890 to 1910, then, there was a marked decline in mortgage indebtedness compared to farm property and income. From 1910 to 1920 there was some increase, but at the end of the period the burden on owner-operators was lighter than in 1890, and the total burden on all farm property was at most no higher. During the subsequent depression this burden was greatly increased and is now much heavier than in 1890. Whether this marks a reversal of trend since 1910 with a rising ratio of interest charges to income it is yet too early to say, but it appears likely that the reversal is temporary due chiefly to the war-time inflation and subsequent depression. The implication of such facts as are available is that the fixed charges, at least, show no tendency toward a permanently growing encroachment on farm income which, if it took place, would mean a decreasing owner equity and growth of absentee landlordism. Apparently agricultural expansion, in the long run, is being financed from within the industry.

Whatever the long time movement may prove to be, it is manifest that the immediate situation growing out of the recent crisis is of much more compelling importance. On this period a little more information is available than for the long time movements. In addition to the census reports of 1910 and 1920 on the mortgage indebtedness of owner-operated farms, estimates of the total farm mortgage indebtedness for the year 1920 have been published by the Bureau of the Census and the Department of Agriculture. The amount of personal and collateral indebtedness of farmers for July 1, 1918, and December 31, 1920, was reported by the Joint Commission of Agricul-

tural Inquiry. Some estimates of interest rates paid by farmers have been published by the Department of Agriculture. On taxation the National Industrial Conference Board has compiled figures showing taxes paid by farmers in 1913, 1919, 1921 and 1922. The writer has estimated these various items for other years from 1909 to 1924, taking into account changes in land values and farmers' cash income.

The results of these computations are presented in the accompanying table and chart, showing the movements of the various items of fixed charges as compared to the gross income from sales of farm products. No great accuracy can be claimed for the figures on either interest charges or taxes in particular years, but it is believed that tendencies are truthfully portrayed.

The general fact brought out by this study is that income and fixed charges with some fluctuations tended to run parallel from 1910 to 1920, after which income slumped in a very marked degree until 1921 while the charges continued to rise. Since that date taxes and interest have become practically stabilized at close to \$1,700,000,000, while cash income has increased from about seven and a half billion to nearly ten billion dollars. The burden of the fixed charges while considerably less than in 1921 is still much greater than in the prewar period.

The total estimated charges for interest and taxes in 1909-10 were 520 million dollars. Ten years later in 1919-20 they had risen to 1,365 million dollars, an increase of 163 per cent. Farm income in the same period increased 154 per cent. Thus fixed charges encroached slightly on cash income. The rate of increase in taxes was greater than for the total group of fixed charges and in bank interest it was probably still more rapid. The

INTEREST AND TAXES IN RELATION TO FARM INCOME

37

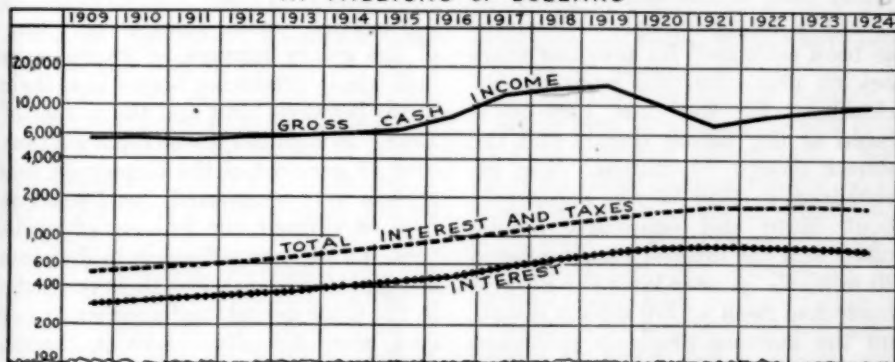
ESTIMATED INTEREST PAYMENTS, TAXES AND CASH INCOME OF FARMERS 1909-24

(In Millions of Dollars)

Fiscal Year	Mort- gage Debt	In- terest Rate	In- terest Charge	Per- sonal Debt	In- terest Rate	In- terest Charge	Taxes	Total Fixed Charges	Gross Cash Income
1909-10.....	3,200	7.0	224	1,000	7.0	70	225	519	5,563
1910-11.....	3,400	7.0	238	1,000	7.0	70	240	548	5,628
1911-12.....	3,600	7.0	252	1,200	7.0	84	260	596	5,478
1912-13.....	3,800	7.0	266	1,200	7.0	84	285	635	5,721
1913-14.....	4,000	7.0	280	1,300	7.0	91	315	686	5,910
1914-15.....	4,300	7.0	301	1,400	7.0	98	350	749	5,948
1915-16.....	4,800	7.0	336	1,600	6.5	104	400	840	6,502
1916-17.....	5,400	6.7	362	1,800	6.5	117	450	929	8,298
1917-18.....	6,200	6.7	415	2,200	6.7	147	500	1,062	12,268
1918-19.....	7,200	6.7	482	2,700	6.7	181	550	1,213	13,766
1919-20.....	7,860	6.7	527	3,250	6.7	218	621	1,366	14,105
1920-21.....	8,000	6.7	536	3,870	7.0	271	730	1,557	10,754
1921-22.....	8,000	6.7	536	4,000	7.0	280	872	1,688	7,462
1922-23.....	8,250	6.7	553	3,750	7.0	263	861	1,677	8,944
1923-24.....	8,500	6.7	570	3,500	6.8	238	875	1,683	9,540
1924-25.....	8,500	6.7	570	3,250	6.5	211	875	1,656	9,900

Farmers' Cash Income and Fixed Charges 1909-1924

IN MILLIONS OF DOLLARS



NOTE.—Data are for crop years beginning July 1; thus the amounts shown for 1924 are estimated income, taxes and interest for the current year July 1, 1924, to June 30, 1925. The gross cash income line represents farmers' receipts from products actually sold, eliminating those fed to livestock or consumed by the farm family. Figures are plotted on logarithmic scale to bring out ratio between the charges and cash income.

mortgage interest charge showed the least relative increase, rising only 135 per cent.

The amount of farm mortgage indebtedness on owner-operated farms was reported by the Census Bureau on January 1, 1920, as approximately

four billion dollars. The total farm mortgage debt was subsequently estimated by the Bureau as 7,858 million dollars for the same date. The reported indebtedness on owner-operated farms in 1910 was 1,726 million dollars. Estimating for other farms on the same

basis as above the total mortgage indebtedness in 1910 must have been about 3,200 million. Very little is available on the rate of interest paid on mortgage loans, but the rate on total indebtedness in 1919-20 has been estimated by the United States Department of Agriculture at 6.7 per cent. Taking this figure and estimating the rate in 1910 to have been 7 per cent, the mortgage interest charge in 1909-10 amounted to 224 million dollars and in 1919-20 to 527 million.

Personal and collateral loans of farmers at the banks were reported to the Joint Commission of Agricultural Inquiry for July 1, 1918, as two and one half billion dollars and on December 31, 1920, 3,870 million dollars. Assuming that the amount of short time loans ordinarily bears some fairly stable ratio to gross sales and that the ratio in 1918 was probably more nearly normal than at the end of 1920, the amount of such personal indebtedness has been estimated for previous years back to 1909. On this basis the indebtedness for the year 1909-10 is placed at one billion dollars and the interest charge 70 million. The indebtedness in 1919-20 was apparently about three and one-fourth billion dollars and the interest charge around 220 million. A year later the interest charge had risen to 270 million dollars and the increase probably continued on into 1921, being estimated at that time as 280 million, or four times the amount paid in 1909-10. These estimates, it should be noted, do not include personal indebtedness other than that owing to banks. Farmers at all times have considerable other personal obligations to individuals and retail dealers, a part of which bears interest and part of which at least nominally does not. So far as the writer is aware, no definite information on the amount of these debts has

ever been published and they are here ignored, although the total doubtless runs to very large figures.

The increase in taxes has been no less marked than that of interest charges. The National Industrial Conference Board's report on "Tax Burdens and Exemptions" places the amount of direct taxes paid by farmers in 1913 at 315 million dollars, in 1919, 621 million, and in 1921 and 1922, 872 million and 861 million respectively. Prorating for other years we may figure about 225 million in 1909-10, which indicates an increase of more than 285 per cent between 1909 and 1921.

FACTORS IN AGRICULTURAL DEPRESSION

These greatly increased payments for taxes and interest have been one of the chief factors of the agricultural depression since 1920. According to a publication of the Department of Agriculture, more than 8 per cent of the owner farmers in fifteen corn and wheat producing states lost their farms between 1920 and the spring of 1923. In addition it was reported that over 15 per cent of the farmers in this section were temporarily insolvent but held on through the leniency of creditors. Of the tenant farmers in the same section 14 per cent lost their property in the same period, and another 21 per cent were actually insolvent though not forced by creditors to liquidate. In all it appears that 10 per cent of the farmers in this territory lost their property through inability to meet interest charges, and more than half again as many were actually insolvent but allowed to retain possession.

A survey of the situation in the northwestern grain section by Mr. John H. Rich, reserve agent of the Federal Reserve Bank at Minneapolis, disclosed that in that area stretching from Montana to northern Michigan

7.2 per cent of the farmers were bankrupt, while a considerable number of others had abandoned their land. The percentage of failures varied greatly in different parts of the area, ranging from 2.8 per cent in northern Michigan to 17.7 per cent in Montana. The figure for North Dakota was 10.5 per cent, South Dakota 7.3, Minnesota 3.7, northwestern Wisconsin 3 per cent. The newer sections, where unsuitable land was opened up under the stimulus of war-time wheat prices and where the one crop system predominates, suffered much more intensely than the older and more diversified regions.

This central and northwestern section saw the heaviest accumulation of debt and underwent the most drastic deflation in the post-war depression. In the eastern and southern portions of the country much less distress is to be noted. The extent of losses in those sections can only be guessed at, but it is probable that we may place the total number of farms actually lost with or without formal foreclosure at about 175,000 to 200,000 or 4 to 5 per cent of the owner-operated farms in the United States.

An interesting sidelight on the causes of failure is given in the Department of Agriculture's publication above mentioned. It is there stated that of the 230,000 farmers suffering loss of property, 43,000 owners lost their farms as a result of purchasing land during the boom period, and 11,000 experienced loss as a result of unwise investments outside the farming field. When reduced to percentages it appears that only 2.7 per cent of the farm owners in these fifteen states failed as a result of land speculation and only one-half of one per cent of all farmers were bankrupted by other speculative investments. These figures do not seem to indicate that farmers lost more heavily

through speculation than did men in other lines of business.

The question of the movement of interest and tax charges since 1920 to 1922, which are the most recent years covered by actual investigations, is almost entirely a matter of speculation. In the case of mortgage indebtedness it may readily be assumed that there has been little new borrowing as there have been practically no transfers of farm lands and very little has been done in the way of improvements, for which purposes mortgages are ordinarily assumed. Some of the floating indebtedness has been funded; but, on the other hand, some mortgages have been cancelled as a result of foreclosure or voluntary surrender of property. From 1920 to 1921 no doubt some increase can be allowed for the mortgaging of unencumbered property to secure current funds. Since that time perhaps a half billion dollars have been written off through liquidations. To offset this one half to three quarters of a billion may be allowed for new loans to fund personal obligations. New loans for other purposes might be expected to exceed somewhat repayments of old loans. Taking these various and variable factors into account we are inclined to place the total mortgage indebtedness at eight and one-half billion dollars, or about half a billion more than in 1921. This figure is considerably lower than other current estimates.

RETURN TO NORMALCY

As regards personal indebtedness, it seems most probable that the total has been somewhat reduced since 1920 and 1921. The latter year probably saw the peak in this item, at which time we estimate the amount to have been four billion dollars. In the last three years, in addition to an estimated half billion of this amount funded, we estimate that another quar-

ter billion has been repaid out of earnings or written off. In the western cattle country advices indicate that indebtedness has been reduced, especially in the Dakotas; and it is well known that debts in the hard wheat section from Oklahoma to the Dakotas are being liquidated out of returns from the 1924 crop. Farmers' taxes probably have not been reduced since 1921.

The burden of fixed charges in the past four years, according to figures of the Department of Agriculture, has at times exceeded the net returns from agricultural operations after costs of production were allowed for. But this burden has decreased each year since 1921. This has been due to increasing income rather than decreasing fixed charges. The total fixed charges, in fact, have remained practically constant between 1,650 and 1,700 million

dollars. Whether this burden continues to decrease during the next few years will depend rather on income than on any changes in the amount of the fixed charges. The latter appear to have become pretty well stabilized at present levels. During the several ensuing years we may look for some increase in farm mortgages as a market for farm real estate once more appears. Personal indebtedness of farmers will probably decline somewhat further as it appears still to be above the normal proportion to turnover. Taxes will probably remain about constant or possibly decline slightly. The bonded indebtedness of counties and local municipal corporations for school buildings and other public construction has ceased its rapid expansion. Salaries of teachers and public officials have been reduced in some cases, and more of a spirit of economy has been enforced.

Taxes in Relation to Earnings of Farm Real Estate

By C. O. BRANNEN

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THE effect of taxation on industry has been the subject of much discussion in recent years. The first question usually raised is, what part of the profits, rents or interest—that is, the returns from invested capital—is required to pay the tax? This is the point of view naturally adopted by the man of considerable wealth, where the effect of taxation is measured largely by the extent to which it cuts away the earnings of invested capital. Every business man thinks in terms of expanding his business, and the tax he pays retards his expansion to that extent. The matter of primary concern to him, therefore, is the extent to which taxation reduces his wealth or the earnings of his wealth. There is a tendency thus to view taxation from the standpoint of its effect on business. The direct proof of this tendency is found in the abundance of statistical data that is being collected by business concerns to show the relationship of taxation to property incomes. One reason for this awakened interest is the fact that so much larger part of property earnings is taken in taxes at present than in former years. Another reason perhaps is the recent movement in state taxation to levy specific taxes on a variety of classes of property and incomes.

Capacity to absorb the tax, which is essentially what this view of taxation means, is based on the idea expressed by Professor Hobson when he says that

such parts of the revenue of anyone as are physically or morally necessary to evoke and maintain the output of productive power which serves to create this revenue, should be excluded from the purview of this

test as possessing no ability to bear taxation.¹

If we apply this theory to a given investment in which capital is employed for productive purposes, we have the application of the same principle, but in a narrower sense. In this sense the returns from an investment would be expected to absorb not only the operating costs and taxes, but also to allow over and above these costs a return satisfactory to the investor. Otherwise, either the capital will be withdrawn and placed elsewhere, or the tax will be borne at the expense of the healthy growth and development of the enterprise. It is in this sense that taxes in relation to farm real estate earnings might be considered excessive.

TAX SITUATION

The U. S. Department of Agriculture has made a series of investigations to ascertain the relation of taxes to real estate earnings. For the sake of brevity the results of these investigations will be summarized for the North Central States. In most of the studies made by the Department cash rent was used as a measure of real estate earnings. Cash rent is considered representative of earnings where a large percentage of the land is operated under the cash rent system. In five of ten counties studied for 1919, taxes absorbed 22 per cent or more of the net cash rent of farms. The tax expressed in percentage of net rent, before deducting taxes, is shown

¹ *Taxation in the New State*, Preface, p. VII.

for these counties in the following table:²

The percentage of farm rents taken in taxes in other regions of the country was found to vary from 6 to 66 per cent, although there was more uncertainty in arriving at the net rent for comparison with the tax in other areas.

While the situation as expressed in these figures was by no means encouraging in 1919, every evidence indicates that it has grown worse since that time. Taxes have not only increased, but rents have been reduced. In Indiana the tax on farm real estate of 109 farms, expressed in percentage of net rent, increased from 12.7 per cent in 1919 to 45.1 per cent in 1922.³

A similar historical trend is found for selected farms in the northwestern counties of Missouri and in the state of Ohio. The results of studies made in these areas are shown in the following table:⁴

² Press release by the U. S. Department of Agriculture, July 18, 1924.

Franklin, Ohio.....	22.4
Tipton, Indiana.....	15.0
Macoupin, Illinois.....	18.2
Lenawee, Michigan.....	38.0
Dane, Wisconsin.....	29.6
McLeod, Minnesota.....	24.4
Moody, South Dakota.....	16.2
Story, Iowa.....	18.8
Wayne, Nebraska.....	11.7
Butler, Kansas.....	23.7

³ Press Release of the U. S. Department of Agriculture, March 25, 1924.

⁴ Unpublished statistics collected by the U. S. Department of Agriculture. The tax in these studies was taken from official records. The net rent was found by deducting from gross rent the costs incident to depreciation, repairs and insurance of farm buildings. By this method the total deduction may be more than is warranted when the value of farm buildings is in excess of normal farm requirements, that is, when the farm is over-improved. The amount of net earnings obtained in such cases may be slightly lower or higher according to the effect of this factor. This inaccuracy is cared for, in part at least, by

While rent in these studies was used as a measure of land earnings, another study of the Department shows the relation of taxes to farm property incomes, mainly from real estate, for 2,669 owner-operated farms in the North Central States. The average return assigned to farm property of these farms for 1922, after allowing current wages to unpaid labor, was \$562, while the tax paid per farm was \$211, or 27 per cent of property earnings.⁵ By the same method Professor Warren shows from other investigations that on farms in Ohio, Indiana and Wisconsin taxes of net business receipts rose from 9.8 per cent in 1913 to 33 per cent in 1921.⁶ Information obtained from other sections of the country indicates that excessive farm taxation is by no means confined to the North Central States. In 1919 in Delaware and Niagara counties, New York, the tax absorbed 31 per cent of the rent; in Payne County, Oklahoma, 29 per cent; in Delta County, Colorado, 24 per cent; in Ada County, Idaho, 28 per cent; in Washington County, Oregon, 38 per cent. Certainly, no more convincing facts are needed to prove that farms are excessively taxed, not only in relation to income, but also in comparison with other industries.

DEFECTS IN TAX SYSTEM

There must be fundamental defects in our system of taxation to explain

making no allowance for any other costs incurred by the landowner.

Year	Indiana	Missouri	Ohio
1919.....	12.7	10.1	30.8
1920.....	23.1	11.7	33.3
1921.....	39.1	19.2	39.6
1922.....	45.1	18.6	44.9

⁵ Rearranged from "Returns from Farming on 6,094 Farms," Preliminary report by the U. S. Department of Agriculture, June, 1923.

⁶ "The Agricultural Depression," by G. F. Warren, *Quarterly Journal of Economics*, February, 1924.

conditions as revealed in these investigations. What are these defects? Some will say, perhaps, that the difficulty is temporary, and, if left to the operation of economic law, will right itself in time. This is doubtful. The major difficulty is inherent in the system of state and local taxation, built up as it is around the general property tax system.

There are several ways in which this system operates to the disadvantage of farm real estate. One of these, if not the leading one, is the use of capital value by state and local governments as the basis of farm real estate taxation. Market or sale value as the standard of real estate assessment has become so thoroughly entrenched, both in our system of land assessment and in the minds of taxpayers generally, that any proposal to the contrary is apt to be regarded as revolutionary. A statistical illustration, however, will show the flimsy foundation upon which the tax based on sale value rests.

Market or sale value, it is generally held, results from the capitalization of present and prospective incomes. With census valuations representing market value, it was found for the ten counties surveyed in the North Central States that the rent of 1919 capitalized at the current rate of interest on first mortgages represented approximately 50 per cent or less of market value, and less than 30 per cent in four of the counties. This means that the annual value of these farms in 1919 was on the average approximately one-third of the estimated selling price, or that two-thirds of the assumed taxable value bore no more apparent relation to the income from which the annual tax was paid than the mere possibility that incomes might increase at some future time. The tax on capital value takes no account of this uncertainty, which one economist aptly refers to as the

"taxation of blue sky."⁷ The capitalized net rental, expressed in percentage of census valuation, for these counties in 1919 appears as follows:

Franklin, Ohio.....	39.9
Tipton, Indiana.....	50.6
Macoupin, Illinois.....	35.5
Lenawee, Michigan.....	33.6
Dane, Wisconsin.....	29.5
McLeod, Minnesota.....	28.8
Moody, South Dakota.....	28.9
Story, Iowa.....	30.6
Wayne, Nebraska.....	29.6
Butler, Kansas.....	31.6

SNAGS IN REAL ESTATE TAX

Aside from the immediate hardship which the tax imposes, a tax based largely on future uncertainties is sure to prove inequitable. If expected future income of farm real estate were realized on the average, the degree to which it is realized by different individuals would vary indefinitely. Some would benefit more than expected, while others would benefit less. This would be equally true of all real estate in one locality as compared with all real estate in another. However, there is no positive assurance that present values are justified on the average. The wave of land speculation has carried land values in certain important agricultural areas to a point at which there is little, if any, possibility of their being justified on the basis of earnings. In other areas, notably in the New England States, rural land values have shown consistent reductions over a long period. Either the over-rating or fluctuation of the selling price of real estate, where sale value is the sole basis of assessment, will cause varying proportions of the real estate tax to be misplaced.

Real estate as a class occupies a unique position in this respect. The taxable value of no other important

⁷ "Taxing Blue Sky," by L. C. Gray, *The Country Gentleman*, Dec. 13, 1924.

class of property is perhaps so largely based on expectations of the future. Limited studies of urban real estate and of banks, two classes of property perhaps excessively taxed next to farm real estate, show this to be true in their case. The capital value of stocks, bonds and the like is largely reflected in the annual income. The *ad valorem* tax in their case, when taxed at all, practically follows capacity as measured by current earnings. While the importance of the change in income as a factor determining capital value varies indefinitely with the different classes of property, certainly real estate stands head of the list in the degree of uncertainty with which the tax is placed. For this reason, even if there were no evasion of taxation, real estate stands the greatest chance of being inequitably taxed as compared with other classes, so long as the present basis of assessment is employed.

Sale value as the basis of the real estate tax is frequently justified on the ground that it serves as a means of taxing land speculation, that is, that the tax is in part imposed on land increment. This justification is perhaps warranted, except in one respect. The tax is imposed upon the estimated rather than the actual increment and before the increment is realized in a beneficial form. Before this estimated increment is realized it may be turned into a decrement. It is to be admitted of course that increment is frequently realized from land and that such increment is subject to taxation in some form, but not necessarily as a part of the annual real estate tax. Whether a tax on the annual value, supplemented by the increment tax with all

the administrative difficulties incident to such a change, would work an improvement over the present capital value tax is indeed a debatable question. Besides, it would break down the stronghold of the general property tax system, which, in spite of all its defects, we have been loath to relinquish. What we may expect, however, is a gradual modification of the system whereby current income or earnings will have a more prominent place in the determination of the taxable value.

The principle of earnings as the basis of assessment is legally recognized in most states as a means of fixing valuations for certain classes of property, and in some of the states it may be used as a factor in determining assessed valuations of any and all classes of property. The system of classified assessments is a recognition of the differences in income realized from certain major groups, although it fails as a rule to recognize this difference between properties of the same class devoted to different uses. One county in the United States now proposes to go the whole distance. In this county it is proposed to fix the assessed valuation of farm real estate according to the capitalized net rental, or its estimated equivalent. All these modifications, although they may be defective, indicate the flow of the under current away from sale value as the standard of assessment and in the direction of property earnings as the basis of taxation. In the more general sense, these changes may signify the ultimate substitution of earnings as the measure of specific taxes on property to take the place of value as now used under the general property tax system.

The Trend in Land Values and Land Utilization

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THE significance of the trend in land values can hardly be understood without considering also the trends and changes in the utilization of land. Land values cannot be measured accurately in terms of land area per capita or "pressure of population," but must be sought in numerous forces and factors. A study of the operation of these forces in the past will help us to forecast the future.

THE TREND FROM 1860 TO 1900

From 1860 to 1900 there were several significant trends in values and utilization. After the Civil War the South decreased both in the land in farms and in land values. In some states farm real estate values were cut in half and the acreage reduced by 25 per cent. It was not until 1880 that the acreage of

eight states, increased their farm land area by at least 5,000,000 acres each per decade. In the last ten years of the last century, Texas alone added 74 million acres to the farm land of the nation.

This astonishing rate of development was due in part to the rapidly expanding railroad net which connected producing sections with consuming centers and with the export ports. Meanwhile England and several of the Continental powers were making rapid strides in industrialization at the expense of their agriculture, and these countries furnished a growing market for the expanding West.

A second factor was the growth of our own population as shown by the following table, which presents the figures in round numbers:

POPULATION AND LAND SUPPLY OF THE UNITED STATES, 1850-1920 *

Year	Population	All Land in Farms		Improved Land		Value of Farm Real Estate per Acre
		Total	Per Capita	Total	Per Capita	
1850.....	23 millions	294 million A.	12.7 A.	113 million A.	4.9 A.	\$11.14
1860.....	31 "	407 " "	13.0 "	163 " "	5.2 "	16.32
1870.....	39 "	408 " "	10.6 "	189 " "	4.9 "	18.26
1880.....	50 "	536 " "	10.7 "	285 " "	5.7 "	19.02
1890.....	63 "	623 " "	9.9 "	358 " "	5.7 "	21.31
1900.....	76 "	839 " "	11.0 "	414 " "	5.5 "	19.81
1910.....	92 "	879 " "	9.6 "	478 " "	5.2 "	39.60
1920.....	106 "	956 " "	9.0 "	503 " "	4.8 "	69.38

* U. S. Census 1920, Vol. V, p. 32. Figures refer to continental United States.

1860 was recovered. After that the South shared more or less the general expansion of the North and West, where the increase in farm land acreage was astounding. Between 1870 and 1900 at least seven, and in one decade

It will be noted that there were 13 acres of farm land per capita in 1860, a figure that has declined since then, though not steadily. The improved land in farms is, after all, the productive part of the farm, and it is nota-

ble that from 1890 to 1910 the amount per capita was at its height. Accompanying the rapid growth of population came the urbanization of the nation. In 1880 about 29 per cent of the people were urban dwellers; in 1900 this proportion had grown to 40 per cent, and in 1920 to 51.4 per cent. This meant that in 1880, 35 million rural dwellers were feeding themselves and an additional 15 million city dwellers. By 1900, 46 million rural dwellers were supporting some 30 million people in the cities. But it must also be remembered that the period 1870-1900 was one of heavy export of farm products. The full significance of this change is more noticeable after 1900, but the effects were beginning to show in the later nineties.

In spite of the growth in population the expansion of farm land produced an over-expansion of agriculture. There was a

hasty and pell-mell outpouring of native land grabbers and foreign immigrants upon an extraordinary stretch of virgin land, not a seasoned economic development upon lines of careful planning with due regard to costs, prices and return to labor and investment. . . . We were conducting the most stupendous bargain counter in the history of agriculture.¹

Between 1860 and 1900 the New England and Middle Atlantic states begin a series of decreases in land values that are significant. Between 1860 and 1870 Massachusetts, New Hampshire and Rhode Island had declines; 1870-80, Vermont, Delaware and New Jersey; 1880-90, practically every state east of Indiana and north of Maryland had serious decreases in farm real estate values; while the decade 1890-1900 witnessed another decrease within the same section; but

the decline was also general over the Far West and in Florida.

There were decreases in the value of farm real estate in many of the new states at various times. However, these figures are an average for all land in the state, and the addition of new and unimproved land often lowers the average. For this reason decreases in average land values in an expanding state are not extraordinary or serious.

The situation in the eastern states is of a different nature. The farm real estate of Vermont averaged \$15 an acre in 1850. It reached \$25 an acre by 1870, then declined for three decades, reaching \$18 by 1900. Some of the other eastern states have had a similar history. It must be remembered that these figures represent the value of both land and buildings.

In 1920 the true value of the land of Vermont was about half of the real estate value. This relationship holds for most of the eastern states, but in states such as Illinois, Iowa, or practically all of the southern states, the land represents from 80 to 85 per cent of the real estate value, and in the western states about 90 per cent. Therefore, the decline in land values throughout the East is really greater than indicated by the census figures. The fact is that the value of the buildings helped to hold up the value of the farms as a whole.

When land utilization is considered in connection with land values, the results are even more striking. New England had over 18 million acres in farms in 1850. This figure was increased to over 21 million acres in 1880, but in 1920 there were less than 17 million acres in farms. The Middle Atlantic states had almost 37 million acres in farms in 1850, a figure which increased to 46 million acres in 1880, but by 1920 had dropped to 40½ million acres.

¹ E. G. Nourse: *American Agriculture and the European Market*, McGraw Hill Co. (1924), p. 28.

What becomes of the land no longer classed as farm land? When land goes out of farms it may go into a "higher use"; that is, it becomes urban or suburban land, or is used for roads, railroad, mining developments, etc. This change in utilization is of considerable significance throughout the East. The presence of cities also has a boosting influence on the value of the surrounding agricultural land by making intensive farming profitable and by making the land valuable for country estates.

While some of the land has gone into a higher use, a great deal more has dropped into a lower use. It is estimated that for the past few years about 1,000,000 acres of such land have reverted annually to forest and brush land in the East. The forest area of New England is today 13 per cent larger than it was 60 years ago. Similarly in the southeastern pineries large areas revert to forest each year.²

The fact that land is dropped out of farm use also removes it from the valuation as farm land. In other words, the poorest land is no longer averaged with the rest. This has a tendency to raise the average for the state or the section, whereas the inclusion of new lands into farms in the new states has the tendency to lower the average, as was noted before.

A better picture of land utilization is presented by the improved land rather than by the land in farms. In 1850, 28 per cent of New England was improved land. By 1880 almost one-third of the land was improved; today 15.4 per cent is so classed. The Middle Atlantic states began with 35.6 per cent in 1850, reached 51.9 per cent in 1880, but declined to 41.5 per cent by 1920.

A further refinement of the study of

² W. B. Greeley, *et al.*: "Timber, Mine or Crop?" *Yearbook*, U. S. Department of Agriculture, 1922, p. 88.

trends in land utilization could be made by noting the change in crops, woodland and pasture on farms. For instance, in 1879 the acreage of hay occupied almost one-third of the improved land area of New England, but today over 55 per cent of a much smaller area of improved land is in hay. On the other hand, the culture on some of the best land has been intensified, as is shown by the increased acreage in potatoes, vegetables and tobacco. The best land has been put into a higher use; the poorer land has gone into a less intensive utilization.

From the standpoint of mere population pressure, land values all over the East should have risen and not fallen, and the utilization of land increased in intensity. In 1850 the New England states, together with the Middle Atlantic states, had 37 per cent of a total population of about 23 million people. By 1900 the population had increased to 76 millions, and this section still had 27 per cent of the entire population. In spite of this the value of New England real estate was but \$2 an acre higher in 1920 than in 1860, and the acreage in farms less than at the time of the Civil War. Land values followed the crest of the wave of expansion, leaving lower values in the trough behind. In 1900 Illinois had the highest land values per acre, with Iowa second,³ whereas in 1850 and 1860 New Jersey had the highest real estate values.

THE CHANGE FROM 1900 TO 1910

From 1900 to 1910 not a state decreased in farm land values. For the whole United States the increase was from \$15.57 to \$32.40 an acre—more than 100 per cent increase—and the percentage of increase was much higher for most of the Middle West, South, and Far West.

All parts of the country felt the in-

³ This refers to the value of land alone.

crease. Practically all the good agricultural land was now in use, and free land of good quality was exhausted. The great increases in land in farms came in Hundredth Meridian states, the Lake states, and in the Far West. Yet decreases in land in farms took place in most of the Corn Belt and the eastern states. A shift to higher utilization is to be noted in nine states which decreased in total farm acreage, but which in spite of this decline *increased* their improved land acreage. Another eleven states increased their improved acreage faster than their total farm acreage, again a gain for the higher utilization of land. On the other hand, of those eastern states which declined in farm acreage, five decreased their improved acres more than all land in farms. Part of the increase in land values may be explained by the higher form of utilization.

The general increase in the value of land was due to the development of the domestic market for our agricultural products, and not to an expansion of foreign demand. Our population increased from 76 million to 92 million, of which almost 46 per cent was now urban, instead of 40 per cent in 1900. There was a marked decline in the exportation of foodstuffs. Part of this loss in export was forced upon us by the tariffs and other restrictions of France and Germany, and by the competition of new sources of raw materials in Russia, South America and Australia. Nevertheless, the change from the foreign to the domestic market was made with few growing pains; in fact, the United States actually became an importer of wheat, barley, wool, hides, and even eggs and butter. Prices of products were such as to give the farmer a profitable return, while the manufacturer and urban dweller began to complain of the high cost of

living; and land values reflected this situation.⁴

THE TREND FROM 1910 TO 1924

The period from 1910 to 1920 is remarkable in many ways. Land values for the United States rose from \$32.40 to \$57.36. Fourteen states doubled or more than doubled their land values. This rapid rise was also accompanied by curious changes in utilization. There was a decline in the per capita area of farm land, improved land, and crop land.⁵ The states east of the Great Plains decreased their farm acreage by 7,000,000 acres with increases only in the cut-over and drained areas. In the West some 84 million acres were brought into farms, largely, however, for grazing, there being an increase of only 24 million acres in improved land. Land in crops increased about 25 million acres in the East and some 20 million acres in the West, or 11.3 per cent, whereas the farm land area for the United States increased only 8.8 per cent. The new crop land came out of pasture land—about half out of improved pasture and the rest from the unimproved pasture within or without farm boundaries.⁶ It is estimated that since 1880 the area devoted to pasture decreased by 81 million acres.⁷

The tendency to utilize the best lands more intensively and to put the poorer lands into a still poorer utilization continued during the war period. The general decline in farm acreage

⁴ E. G. Nourse; *op. cit.*, pp. 28-38.

⁵ "Crop land" represents a higher utilization than "improved land." The latter includes "land regularly moved and tilled" whether in crops or not.

⁶ L. C. Gray, *et al.*: "The Utilization of Our Lands for Crops, Pasture and Forests," *Yearbook*, U. S. Department of Agriculture, 1923, pp. 435-437.

⁷ *Ibid.*, p. 438.

was accentuated by the scarcity of farm labor which made it necessary for farmers to curtail their acreage. The high wages paid in manufacturing industries drew the farm laborers away from agriculture and even induced operating farmers to abandon their farms. This condition has continued up to the present time, especially in the past few years when the returns in agriculture have been abnormally low.

UNWONTED EXPANSION AND REACTIONS

The normal development of agriculture was therefore thrown out of joint by the war. Europe's energies were devoted to the manufacture of war materials and shipping. Because of the difficulties of ocean transportation the Allies turned from Argentine, Australia and India to America for foodstuffs and the volume of our exports went back to that of the nineties. Coupled with the needs of our own urbanized population, emphasized by war conditions at home, the demand for agricultural products created extraordinary prices. These prices rose faster than the prices which entered into the farmers' cost of production, and farming began to show a profit in 1915 and even more so in 1916 and 1917.⁸ The high prices continued throughout 1919 but broke sharply in 1920.

The expansion of agriculture came through a readjustment in the utilization of land, and not through any significant increase in farm land. The acreage devoted to production for domestic uses was reduced. The land usually devoted to livestock production decreased. Fallow lands were sown to grain in many places and in others long established rotations were neglected to produce the essential war crops.

This unnatural expansion has had

⁸ E. G. Nourse: *op. cit.*, p. 56.

its reaction. Since the war the utilization has tended to go back to its former status, but not without difficulties. In the Great Plains region farmers have found it almost impossible to contract their wheat acreage.⁹

The sudden rise in the prices of farm products together with the lag in "labor-capital" costs of production produced a high land income, and an unprecedented rise in the value of farm land which assumed veritable booms in some states. Soon after prices began to drop land values also were deflated. The 1924 prices of land are about 71 per cent of the 1920 prices for the United States as a whole. Iowa land values have dropped to 65 per cent of the 1920 prices, Montana to 58 per cent, whereas more conservative states such as Wisconsin and Pennsylvania have values equal to about 80 per cent of the peak price.¹⁰

In the Bluegrass region of Kentucky sales records show that land went from \$171 an acre in 1917 to \$289 in 1920.¹¹ The suddenness with which the boom collapsed here is shown by the fact that in some of these counties the values were practically cut in half by 1921.¹²

At the present time we are just emerging from the depression. For many parts of the country land values struck bottom in 1922 and 1923. Surveys of the farm land market were made by the National Association of Real Estate Boards in both of these years. In October of 1923 the market was reported as practically inactive

⁹ L. C. Gray, *et al.*: *op. cit.*, p. 449.

¹⁰ See table showing the value of plow lands for the United States, 1916-24, in *Yearbook*, U. S. Department of Agriculture for 1923, p. 1146.

¹¹ G. W. Forster: "Land Prices and Speculation in the Bluegrass Region of Kentucky," *Kentucky Experiment Station Bulletin*, 240, p. 49.

¹² Twenty-fourth Biennial Report, Bureau of Agriculture and Labor Statistics, Kentucky, 1920-21, pp. 147-9.

and only 36 per cent of correspondents said that their market had improved over 1922.¹³ This year a similar survey shows an increase of 42 per cent in the number of farms sold over 1923. Only 15 per cent of the replies reported a poor market; 88 per cent of the replies indicate that prices are going up, or are at least stationary. In other words, the deflation of 1919-20 is complete and prices have "nowhere to go but up." This fact in itself gives an optimistic tone to these reports.¹⁴

FUTURE TREND

What of the future? The continuing scarcity of land has been obscured by the over-expansion of agriculture during the World War. Instead of expanding our acres we have converted pasture into crop land. This cannot continue forever. Furthermore, the cutting of lumber from a virgin forest also gives the impression of an inexhaustible supply of farm land. "Farms follow forests" is the old slogan, but much of the present cut-over land is submarginal for crops. Forest land has not been a competitor of farm land in the past, but with the continually increasing prices of forest products it must be expected that forests will not only reclaim the submarginal agricultural land but will also bid for a place on some of the less desirable crop land as well.¹⁵

We cannot expect a revival of the foreign market such as we had during the war. The surplus which was thrown back on us and which helped to bring on the present depression is being absorbed, as it was in 1900-10, by

¹³ *Survey of the Farm Lands Market for October 1923*, Farm Lands Division, National Association of Real Estate Boards, Chicago.

¹⁴ *Second Annual Survey of the Farm Lands Market*, November, 1924, Farm Lands Division, National Association of Real Estate Boards.

¹⁵ L. C. Gray, et al.: *op. cit.*, pp. 451-455.

the increasing population at home. Urbanization has continued; in 1920 over 51 per cent of the people were urban dwellers, and since the close of the war the rural people have flocked to the cities by the millions every year. In fact, the actual *farm population*, as determined by the census in 1920, was only about 30 per cent of our total population.¹⁶ Our population growth will make itself felt in higher prices for food and raw materials and in higher land values. How fast this pressure will come is a matter of speculation. The Bureau of Agricultural Economics of the U. S. Department of Agriculture has made careful estimates of the possible scarcity of land in the next three or four decades, based on an estimate of 150 million people by 1950. Assuming a very moderate change in our standard of consumption and a slight increase in our productive efficiency, they estimate that an addition of only 40 million acres of crop land and improved pasture to our present farming area would provide for a population of this size. Allowing for a forest area equal to the present one, this additional farm land can be selected out of some 400 million acres of potentially arable land.¹⁷ However, practically all of this potential farm land is in need of drainage, irrigation, or is inferior in quality, and the selections ought to be made carefully. It is not deemed necessary to reclaim large areas by irrigation or drainage during the next few decades. "Certainly there would be no justification in undertaking such reclamation except in the cases of projects where the economy of reclamation could be demonstrated unequivocally."¹⁸

From the foregoing the conclusion

¹⁶ U. S. Census, 1920, Vol. V, p. 892.

¹⁷ L. C. Gray, et al.: *op. cit.*, pp. 495-496.

¹⁸ *Ibid.*, p. 497.

can be drawn that the utilization of land for crops and improved pasture will go forward moderately fast. An increase of 40 million acres in 25 years would call for an expansion of less than 2 million acres per year. During the war decade there were added 45 million acres of crop lands to the arable area of the United States, more than will be required during the next 25 years according to the above estimates.

The trend in land values and in land utilization in the future is a matter of conjecture. Undoubtedly the reversion of the lowest grades of land will continue, and the better lands will move into higher utilizations and higher values. The expansion of crop lands in the future must come out of lands increasingly submarginal, and prices of products must rise enough to make the transition to agricultural land possible. Better land will feel the effects of such a rise in prices of farm products.

But there are other variables in the determination of land values. A lowering of the interest rate will have a

tendency to raise land values. On the other hand, the rate of population growth has declined and may decline more in the future. Furthermore, we have by no means reached the limit of improving the technique of agriculture. Should two blades of grass be made to grow where but one grew before, the increased production will have a marked effect on the value of land. Should the two last factors happen together we may even expect to have a general downward movement in land values, except in those regions where farm land values are due to amenities or other factors.

Finally, the readjustment of the world's agriculture must be considered. New lands are being brought into use everywhere; the tropics are being developed and the Corn Belt and dairy farmers are beginning to feel the competition of vegetable oils. New cotton regions are being opened in Africa, South America and India. The extent of such foreign competition will have a profound influence on the value of our farm lands.

Migration To and From Our Farms

By CHARLES L. STEWART

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MIGRATION is the shifting of residence of individuals or families into or out of a designated area during a designated period of time. Daily trips from one's residence in the country to one's place of work in town or vice versa are excluded from this definition. Migration is analogous to the movement of supplies out of an area of market surplus into an area of market deficit. Most migrations, but not all of them, are movements on the part of persons,—breadwinners among them—who are responding to stronger demands for their nearly fixed supply of body and brain power.

GROSS Versus NET MOVEMENT OF POPULATION

From the standpoint of an area designated for migration study there is always a combination of emigration and immigration. The *in*-movement of one such area is related to the *out*-movement from one or more other areas, just as the *out*-movement from this area is related to *in*-movements of other areas. The net result of a movement affecting an area may be positive or negative, and may be large or small either absolutely or relatively to the gross movements. Very slight gross movements sometimes merely equalize one another. If attaining sufficient magnitude, net movements may be designated as filling or recruitment migrations, from the standpoint of areas being made to increase in population, and emptying or evacuation migrations, from the standpoint of areas being depopulated. Where the result of two gross movements is for one to replace

numbers equal to those removed by the other, the combined movement may be called a replacement migration.

There are two main classes of migration affecting the farm population. In one class the migrant shifts from farm to farm. In the other class the migrant shifts from town to country or from country to town.

SEASONAL MIGRATION

There is all too little statistical information concerning seasonal migration in the United States.

Seasonal migration of farm operators. Farms whose operators do not live upon them throughout the year are numerous in some districts in which fruits and vegetables are grown. In nearly all districts, however, there are some farms to which the operators come during only the rush season. Movement from and to winter resorts on the part of western ranchmen and southern planters, while not general, are cases illustrating this point. Somewhat analogous are the winter movements to nearby towns on the part of operators and others in one-crop areas where winter is especially severe.

Seasonal migration of farm laborers. Statistics of farm labor demand show that in practically every state there is a heavy demand during the main harvest months and in some instances a heavy demand during the period of planting and tending crops. If the seasonal curve of demand for farm labor in a given area shows a high peak once, it is probable that much casual labor will be attracted into that area. Much depends, however, upon the length of

the harvest season. During corn husking in the corn belt, farm hands from the border states sometimes find employment on two or three farms, consecutively. In harvesting of grain and hay, however, migrating laborers work for a much larger number of consecutive employers.

Three regions of the United States are traversed by migratory harvest laborers to a marked extent. One of these is the Great Plains Region with its spring wheat harvest in the northern portion following the winter wheat harvest in the southern portion. The other two regions are the coastal plains of the Atlantic and Pacific Oceans. The coastal regions have the wider varieties of harvested crops, vegetables figuring on both coasts with fruit and grain added in the Pacific Northwest. The movements of laborers in these regions have been such as to lead to their consideration as labor streams. These streams are subject to high percentages of additions and withdrawals, however, and of those who become part of the streams only a small proportion continue through the entire range of latitude.

Seasonal migrations, whether in pursuit of employment or relaxation, create problems in community relationship. Evacuation areas may suffer because of the absence of people during a considerable part of the year and recruitment areas may suffer because of the accumulation of people during a short period of the year.

ANNUAL MIGRATIONS

The main migration in which farm operators figure is that which involves the initiation or termination of annual relationship to farms. This annual migration to the farms has a seasonal incidence, to be sure, but is not to be confused with the seasonal migration previously mentioned. Both owner

operators and tenant operators begin and end their operations on these farms about as indicated in the following table of monthly distribution, the percentages of which total 100: January, 28; February, 6; March, 18; April, 3; May, June and July, about $\frac{1}{3}$ of 1 per cent each; August, 1; September, 2; October, 3; November, 9; and December, 29. Moving in the late winter and early spring, especially in March, is found generally, except in southern states where December-January moving predominates. In general, the moving period falls within the bounds set by annually finishable products. The season of minimum unfinished operations, when farmers have a breathing spell, is the time when operators can best move.

The annual migration of tenant farmers. An indication of the amount of shifting of farm operators is given in figures of the Bureau of Agricultural Economics for the one-year periods ended April 10, 1924, and December 1, 1922, and in reports of the Bureau of the Census as interpreted with special reference to the one-year periods ended January 1, 1920, and April 15, 1910. In the more recent of these two series the number of farms having had a change of tenant operators during the preceding twelve months is estimated to be 420,000 in 1924, and 660,000 for 1922. The number of tenants on farms not operated by them during the preceding year includes all those on the farms just referred to, together with those on farms which had undergone less than a year of tenant operation immediately preceding. The effect of adding the second group of tenants is to increase the numbers given above for 1924 and 1922 by not more than 50 per cent, and probably by not more than 25 per cent in most parts of the country.

During the year ended January 1,

1920, tenants to the number of 426,774 became operators of the farms which they were operating when the census was taken. This figure is less than 58 per cent of the corresponding figure for the year ended April 15, 1910, namely 744,293, and doubtless needs to be corrected by the addition of a considerable proportion of those reporting occupancy of one year but less than two years, the 1920 figure for which is nearly 152 per cent of the corresponding 1910 figure. The difficulty, of course, lies in the fact that a quarter of a million or more incoming tenants, who began occupancy after January 1, 1919, reported that they had been in occupancy a full year on January 1, 1920.

Allowing for discrepancies in the statistics for 1922 and 1924, it is safe to conclude that instead of three-quarters of a million tenants in occupancy less than a year, as indicated for the year begun April 15, 1909, the number was nearly 65,000 in 1919, less by over 80,000 in 1922, and by nearly a third of a million in the year begun April 10, 1923.

It would be inferred from the estimates of the Bureau of Agricultural Economics that the depression years were less characterized by shifting from one tenant farm to another than were the years preceding the two most recent census dates. It is possible, of course, that the agricultural census of 1924-25 will give evidence of a permanent decline in the proportion of tenants who move from farm to farm during the annual moving period. Until the results of this census are available, however, it seems best to assume that decreased migration during the depression years is to be attributed to economic conditions then prevailing.

It is logical to expect that neither landlords nor tenants would try to stimulate tenant changes during hard

times. Landlords are usually willing to give tenants further trial when there are sufficient grounds for believing that the blame may not be imputed entirely to the tenants. The policy of "not swapping horses while crossing streams" is followed by many experienced owners of rented property. Moreover, tenants are less able to afford the luxury of moving during depression periods, and, in some cases, may have become anchored to the premises by the weight of debts owed to landlords. Landlords apparently were called upon to underwrite the obligations of their tenants not only in southern states, but in many portions of the country in which this practice had not previously been customary. The inability of tenants to escape from debt as easily as had been possible before the depression came on is probably a main factor in the reduced turnover of tenant population on tenant farms.

The mental satisfaction of moving at will is not to be confused with the net gains achieved. The economic loss incurred in not moving is doubtless smaller than the economic gain expected from moving. It is possible that the experience of the last few years has brought this fact home to a great many tenants, and that there will be a continued reduction in the amount of tenant shifting in the next few years. To some students of our problem of migratory population, this development would be welcome.

On the other hand, it is probable that tenant migration in the depression years has been distress migration in a large proportion of cases, the distress characterizing the tenant himself or the present or the former owner of the rented land. Landlords who were forced back from retirement into active operation of their farms have had to displace tenants. Owners, many of them active operators of land for years,

allowed their land to go back to stronger hands in satisfaction of debts. Many of these new owners called for tenant operators. Many tenants, moreover, lost their operating equipment by sheriff's sale, or otherwise. In many cases the dispossessed tenants sought new landlord connections or gave up farming operations entirely. The proportion of operators who lost property or who stood at the mercy of their creditors in 1923 was larger in the case of tenants than in the case of operating owners. In the preceding year, it is estimated that nearly 250,000 tenants either discontinued farming for other occupations or moved out of their communities.

MIGRATION FOR PERMANENT SETTLEMENT

Most of the tenant shifts are from farm to farm within the same community, but many tenants migrate into new agricultural regions. During the depression years the distress in the northwest wheat areas and in western states in general was such that much of the westward migration of tenants was discontinued. Many of those who rented land in western states had been owners of land in states farther east.

Movement of owner operators to new farms. In the year ended April 15, 1910, 6.9 per cent of the operating owners had come into occupancy, and in the year ended January 1, 1920, without allowing for shortage, 5.7 per cent. These figures reported by the Bureau of the Census may be compared with the estimates of the Bureau of Agricultural Economics, indicating that for the year ended December 1, 1922, the percentage of farms changing ownership was 6, and for the year ended April 10, 1924, it was 7. The larger figures include farms that were operated by renters both before and

after change of ownership. In the light of the two lines of statistics it is safe to estimate that a quarter of a million new owners each year take up the operation of farms not previously operated by them.

Not all of the incoming owner operators have purchased before entering into occupancy. Of the 100,000 young men below the age of 35 who begin owner occupancy during an average year, about half come into possession by inheritance or by marriage. The other half of this group purchases and moves upon farms less because of adequate savings than because of determination to buy land, even though possessing but small equities. The depression years have diminished the numbers and weakened the farm-buying resolution of this group.

The extent to which owner operators have been drawn into new areas from farms in older farming regions or from town is not measured statistically. During the depression years it is believed that homeseekers' excursions had much less vogue. In many cases persons, who during the land boom in 1919 bought farms to operate, returned to their native areas in subsequent years as their equities disappeared. Increased attention was given to state real estate license laws during the depression period, although the desirability of many of these laws, so far as relating to farm land, remains to be tested in a more active period of farm buying. Many of the more severely victimized land buyers were citizens of distant states. To prevent many of these migrants from being imposed upon, it would have been necessary for local and state authorities, and possibly for Federal authorities, to give special attention to interstate transactions in farm lands.

The movements thus far considered are gross movements and leave out of

account the changes in the statistical position of the farm population as influenced by natural increase of population. The significance of natural increase as a factor in the cityward movement will be emphasized in that which follows.

PROPORTION OF POPULATION OCCUPIED AND OF OCCUPIED PERSONS ENGAGED IN AGRICULTURE, UNITED STATES, 1820-1920.

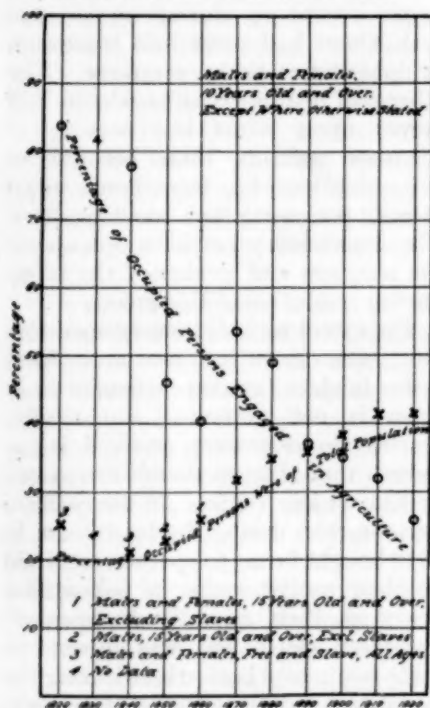


FIG. 1.—A larger proportion of the people were working, but a smaller proportion of those working were occupied at agricultural pursuits during the later decades than before. The latter movement has loaded the city population with mature workers drained from rural districts.

CHANGES DURING TWO HALF CENTURIES

Space does not permit discussion of the effects of differences of enumeration and classification on the census results shown in Figures 1 and 2. Cer-

tain inferences, however, can be safely drawn.

(1) The percentage of the entire population engaged in occupations increased during the century following 1820, most of the increase occurring between 1850 and 1900. During the

TRENDS OF TOTAL POPULATION AND OF NUMBER OF PERSONS GAINFULLY OCCUPIED, UNITED STATES, 1870-1920.

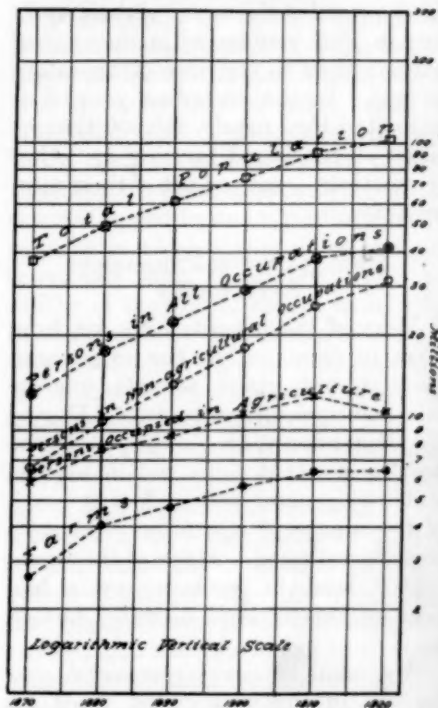


FIG. 2.—During the last half century the number of persons occupied in non-agricultural pursuits increased at more rapid rates and at rates showing less tendency to decline than did the number of persons occupied in agriculture. Since 1920 the migrations have been mainly cityward.

80 years or more within which fell the nine census dates, 1840 to 1920, an average decade witnessed an increase of about 2.4 percentage points in the proportion of all persons in the specified age and sex groups reported engaged in occupations.

(2) The percentage that persons engaged in agriculture were of all persons in occupations decreased markedly and persistently. During the 80 years or more just referred to, an average decade witnessed a decline of about 6.5 percentage points in the proportion of all occupied persons reported engaged in agriculture.

(3) The rate of increase in the number of persons engaged in agriculture has been declining so that the first quarter of the 20th century may be the first to show a practically stationary condition. The 1910 census figures must be discounted and the 1920 figures regarded as considerably short in comparisons made for the purpose of determining whether the number of persons in agriculture during that decade was declining or merely standing still. It is probable that there was no decline in the number of persons engaged in agriculture until 1919 or 1920, especially if the part-time workers are given full weight.

(4) The decline in the rate of increase in the number of persons in agriculture is more marked than the decline in the rate of increase in the number of persons in other occupations. Had the rate of increase in the number of persons occupied outside of agriculture been sustained, it would seem reasonable to suppose that the net exports of agricultural products would have been smaller and that the rate of increase in the number of persons occupied in agriculture probably would have been sustained.

CAUSES FOR MIGRATION CITYWARDS

Even more notable are the shifts of population from farms to cities in the United States during the depression years since the 1920 census. In 1922 farmers occupied 86.3 per cent of the habitable farm houses in the United States as compared with 88.4 per cent

in 1921 and 89.7 per cent in 1920. In New York there were heavy declines in the number of agricultural workers during the years ended February 1, 1923, 1921 and 1920. In Michigan there were 16 per cent fewer farm workers indicated for June, 1923, than a year before. The Bureau of Agricultural Economics estimated the net change of population from farm to town in 1922 at around 1,200,000. Subsequent migrations from southern states have attracted special attention, although reliable figures as to either the gross or the net movements are not available for all the farms in any considerable area of that region.

The fact that the number of persons engaged in agriculture reached a historical maximum in the United States at some time during the last two decades, possibly during the last decade, indicates that the capacity of the farm population for natural increase has been at high tide during the first quarter of the 20th century. For the farm population to remain constant under such circumstances it is apparent that there has been a large net out-movement of persons reared on farms or engaged in agriculture at least temporarily. For the net out-movement to exceed the natural increase, as during the depression years, there must have been a potent combination of influences at work.

Causes for the persistent decline in the proportion of occupied persons engaged in agriculture probably include the following:

(1) The increase in the proportion of the population engaged in producing commodities and in rendering regular services;

(2) The decrease in the proportion of part-time agricultural workers residing on farms;

(3) The increase in the ratio of

working years per capita to the per capita life span, so far as resulting from increased longevity of persons attaining working age;

(4) The decrease in the proportion of farm labor time absorbed in clearing, draining and fencing land and in equipping land with structural improvements;

(5) The increase in the use of city-made machinery and devices saving farm labor;

(6) The increase in the use of mineral instead of agricultural sources of fuel and dyes;

(7) The decrease in the relative prominence of agricultural products among the nation's exports;

(8) The decrease in the proportion of all immigrants who become engaged in agriculture in this country;

(9) The decrease in the proportion of farm products consumed on the farm or in nearby markets;

(10) The relative inelasticity or inexpandibility of per capita demand for foodstuffs and agricultural raw materials as compared with the relative elasticity or expandibility of per capita demand for professional services, for personal and commodity transportation, and for the conversion, fabrication and elaboration of goods; and

(11) The shifting of household manufacturing, farm shop work, and some of the road hauling to persons no longer classified as engaged in agriculture.

Causes for movement into and out of various agricultural regions and areas are partly included in the preceding list. Several other causes may be added to help account for these migrations:

(1) The effect of differences and changes in cost of transporting commodities to and from consuming markets;

(2) Differences in the relative cheapness or dearness of: (a) farm land, (b) farm capital, and (c) farm labor;

(3) Differences and changes in the availability of land resulting from irrigation and drainage.

Reasons why individuals and families have joined the cityward movements or land-settlement movements are complementary to the causes enumerated. Dependent persons naturally move with migrating breadwinners. Some breadwinners shift on account of similar action by others. Probably the majority move, however, because of rational desires to find new environments suited to their particular abilities or tastes.

ECONOMIC CONSIDERATIONS

In general the cityward drift in the United States has resulted mainly from economic considerations. These occupied an even more dominant position during the depression years. During these years farm wage scales declined to smaller percentages of their highest levels than did wage scales in most other important occupations. The diminished wage-paying capacity of employing farmers caused the demand for farm labor to allow the scales to fall as they did. Relatively high wage scales continued in occupations competing for this labor and drew down the farm labor supply to the lowest figures in several decades. The result was to force various economies in the utilization of hired labor on farms, particularly in southern plantation and western ranching areas and in districts in which cattle feeding and dairying were conducted by large-scale operators. The result was a tendency toward the utilization of land in crops requiring little farm labor, toward pasturing off crops otherwise harvested and marketed at heavy

labor cost, and toward rigorous utilization of the family labor supply. In some areas of the South and West, Mexican labor afforded relief.

Increased dependence on family labor was less marked in the South, perhaps, than in other sections. Even before the depression began, women and children in southern states were furnishing farm labor up to the toleration point. It is not surprising, therefore, that southern farmers were reported to be in favor of increased immigration from other countries.

On the whole, it is probable that the desire of farm operators to keep the children on the farm was increased as a result of the migrations of the depression years. The economic importance of child labor in agriculture was augmented. This may help to explain the opposition of some farm organizations to more stringent child labor legislation. Farm operators who displayed little opposition to Federal restriction of immigration have apparently shown strong opposition to Federal restriction of child labor. This has probably resulted less from desire to have the labor of their own children utilized in place of immigrant labor than from fear that all kinds of labor might be available only at wage scales beyond the wage-paying capacity of employing farmers, or of confidence in the salutary effect of farm labor as performed by children.

To some observers, the conversion of partially self-sufficing farm workers into city dwellers would seem to be an unmixed blessing for persons remaining in agriculture. So far as the shifted population sets up more commercial demand for farm products and removes competing producers into industries, of which the products are purchased by those remaining in agriculture, the effects of net migration to cities are of immediate benefit to those who con-

tinue to farm. To many farmers employing hired labor and to some employing family labor, however, the question is whether more assistants than competitors have not been swept away by the cityward current, and whether it might not be as well for persons engaged in agriculture to subsidize industry with cheap food and raw materials as to subsidize it with farm-reared youths and prospective heirs to farm real estate.

Persons taking up occupations which are growing rapidly receive property by inheritance from parents in occupations growing less rapidly or declining. An occupation which fails to hold its own in relative numerical growth is caused by our laws of inheritance to yield title to its accumulations to heirs who have turned to other occupations. Of the several occupations thus faring, agriculture has had the wealth of its accumulators scattered to persons in other occupations, generally resident in town, more persistently and in amounts reaching larger figures than in the case of any other occupation in the United States during the last century. Rents and purchase funds paid to town and city heirs of farm property are largely received in other taxing jurisdictions. Perhaps a quarter of a billion dollars of wealth produced annually during the last ten years was taken into other taxing jurisdictions, as a result of migration of inherited land titles incidentally to the cityward movement.

Farm parents are naturally impressed with the fact that their children leave them to go into other occupations after having received care during infancy and at least elementary education. Many young people use their farm rearing as a springing board for an early plunge into non-agricultural service. The proportion of children below working age on farms is

high relatively to the corresponding proportion of children enough older to be capable of pulling a part or all of their own weight. According to the 1920 census, 504,000 persons in every million of the farm population were under 21 years of age, as compared with 375,000 in a corresponding urban population. The migration of 65,000 mature persons to the farms, or 65,000 young persons to urban districts would be required to equalize the age distribution. The farm population can be said to have been short by about 2,000,000 adults and long by about 2,000,000 persons under 21 years of age. An excessive portion of the burden of giving our total population its high-school and grade-school education has fallen upon farm parents. The cost of this education tends to be borne according to the occupational distribution characterizing the population of the second or third decade before the pupils find places in the occupations. This circumstance would seem to justify the procedure some states follow in allotting state funds for the support of grade schools to the districts in accordance with the number of pupils enrolled, or of granting to country school districts relief from even a larger proportion of the per capita school expenditure than is afforded to town and city schools.

CONCLUSIONS

Migrations affecting the farm population have occurred in response to economic conditions. During the depression years migrations from farm to farm were reduced, the reduction implying much distress but probably causing little. Migration from farm to town attained notable proportions for the first time in the history of the United States during this period, resulting in widespread diminution in the farm population and in the number of persons engaged in agriculture.

The transfer to town of persons whose requirements of foodstuffs and other agricultural products must be supplied by persons remaining on farms will doubtless help to advance the prices of farm products. Farm operators requiring hired help, however, find this a mixed blessing. The proportion of prospective heirs to farm property, who are engaged in non-agricultural occupations, has probably been increased by the recent migrations. Even more than previously the non-agricultural destination of farm-educated youths calls for more satisfactory apportionment of the burden of taxes used in supporting primary and secondary education and perhaps in supporting some other objects of tax expenditure.

The Trend in Tenancy and Ownership

By A. M. LOOMIS

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AS time and space limits curtail very sharply the part of this important topic which can be here discussed, I wish to say at the outset that, so far as any specific study of the problem of tenancy by itself is attempted here, it will be in terms of number of tenant farms, and not size or values represented by these farms. This phase of the subject—the number of tenant families or units—is the crux of this problem so far as it affects the social influence of tenancy, and is a fair measure of its economic influence.

The number of farms occupied by tenants in the United States enumerated in the 1920 census was 2,454,804 or 38.1 per cent of all the farms therein counted. In 1910 the number of tenant farms was 2,354,676 or 37 per cent of all the farms counted in that census. In this decade the total number of farms increased by 37,000 or about 1.37 per cent, and 684,343 farms were counted in the 1920 census. With these figures in mind, the following is of interest:

- (1) Number of farms operated by their owners decreased about 23,000.
- (2) Number of farms operated by managers increased about 10,000.
- (3) Number of farms operated by tenants of various kinds (cash, share and share-cash, "croppers," standing tenants, etc.) increased about 100,000.

This increase was 4.3 per cent of the number of tenant farms counted in 1910, but only 1.6 per cent of the total number of farms.

These figures, stated in terms of nation-wide application, do not bring out the real question involved, except to call attention to the fact that tenancy is actually and relatively increasing.

There are state totals and comparisons available. In the decade 1910-20, the census figures show that tenancy decreased in, or stood nearly without change in, all the New England states, New York, New Jersey, Delaware, Maryland, Virginia, West Virginia, Pennsylvania, Ohio and Kentucky. The percentage of tenant farms increased in every state west of the Mississippi River, except in Missouri and Oklahoma, and also increased in Indiana, Illinois, Michigan and Wisconsin. In the southern states there was less change, but the percentage was high in all of the southern group due to the prevalence of the "cropper" system, and remained high throughout the decade. There was a slight reduction in Florida and in Alabama, almost no change in Mississippi and Tennessee, and an increase in Georgia, North Carolina, South Carolina, Louisiana, Arkansas and Texas.

The percentage of increase by states was as follows:

Michigan.....	6.2	Kansas.....	2.0	Idaho.....	110.2
Wisconsin.....	10.6	North Carolina.....	9.5	Wyoming.....	119.4
Minnesota.....	34.5	South Carolina.....	11.7	Colorado.....	64.0
Iowa.....	8.5	Georgia.....	8.4	New Mexico.....	86.8
North Dakota.....	86.8	Arkansas.....	11.1	Arizona.....	109.2
South Dakota.....	35.4	Texas.....	5.8	Washington.....	60.7
Nebraska.....	8.1	Montana.....	177.6	California.....	38.5

In the states not named in this table, tenancy decreased in the 1910-20 decade.

The Bureau of Agricultural Economics of the U. S. Department of Agriculture made a study in the early part of 1923, covering changes in farm occupancy, ownership and tenancy in 1922,¹ and this adds some data which increases the concern which might be aroused by the above showing. This study contains a tabulation of replies received, indicating that during the year 1922 tenancy increased in the following states by the percentage indicated:

Maine.....	3	North Dakota.....	7	Alabama.....	1
Massachusetts.....	9	South Dakota.....	4	Mississippi.....	1
New York.....	3	Nebraska.....	3	Arkansas.....	1
New Jersey.....	2	Kansas.....	4	Louisiana.....	1
Pennsylvania.....	1	Maryland.....	2	Texas.....	3
Ohio.....	2	Virginia.....	1	Montana.....	16
Indiana.....	2	West Virginia.....	6	Idaho.....	13
Michigan.....	3	North Carolina.....	1	Wyoming.....	12
Wisconsin.....	5	Florida.....	8	Colorado.....	12
Minnesota.....	1	Kentucky.....	2	Oregon.....	1
Missouri.....	1	Tennessee.....	2		

In the states *not included* tenancy decreased in 1922. This is an indicated increase in per cent in a single year. Note the inclusion of several states which had indicated a decrease in tenancy in the previous census decade. Note also the inclusion of nearly all those states which increased in that decade, the exceptions being South Carolina, Georgia, Iowa, Arizona, Utah, Washington and California.

In an effort to bring the figures to date, I have applied the percentage of increase, as shown by the Stewart study of 1922, to the 1920 census figures. I realize that this is but an approximation, but it is the only study of which I can find a record indicating trend since 1920, which, as is well known, was a time of agricultural

inflation partially ended by 1922. The Stewart figures represent a single year's change, shown by replies to a questionnaire sent to over 10,000 correspondents located in every agricultural county in the United States. Adding these percentages to the increase shown for the decade of 1910 to 1920, and using the total to indicate the increase from 1910 to 1924, results in what I am confident is an under-statement of the existing facts rather than an over-statement.

TENANT AND OWNER FARMERS

The result of this approximation indicates that at the present time, with

the exception of Colorado and Idaho, the states in which there is less than 20 per cent of tenant farms probably include only the New England and Mountain groups. States with between 20 and 30 per cent of tenant farms are New York, New Jersey, Pennsylvania, West Virginia, Virginia, Florida, Michigan, Wisconsin, Minnesota, Colorado, Idaho and the Pacific group. States with between 30 and 40 per cent of tenant farms are Kentucky, Ohio, Indiana, Missouri, North Dakota and South Dakota, and probably Delaware and Florida. States with more than 40 per cent of tenancy divide geographically into two fairly well-defined groups:

(1) A midwestern group including Illinois, Iowa, Nebraska and Kansas.

(2) A southern group including Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi,

¹ Preliminary Report on Farm Occupancy, Ownership and Tenancy, Charles L. Stewart, 1923.

Louisiana, Arkansas, Oklahoma and Texas.

In the southern group this problem presents distinct aspects—the prevalence of the “cropper” system previously referred to. In census work “croppers” are counted as tenants. In all statistical studies of this problem the predominance of “cropper” farms in certain states introduces a factor which must be segregated and studied by itself. Space in this paper does not permit this special treatment, except to say that it probably presents the most serious problem found in the whole subject of tenancy in the United States.

The percentage figures quoted indicate the density of the problem, and when multiplied into the number of farms and the volume of agriculture, the result shows the extent of the problem. That is, an increase of 120 per cent in tenancy in Wyoming, where there are comparatively few farms, has much less significance from a national standpoint—none the less significant, however, to those immediately concerned—than the 8 and 9 per cent increase in Georgia and Alabama, where the number of farms is large.

All this assumes that a high percentage of tenancy is not a desirable condition. Probably both sociologists and economists will agree on this. However, a certain amount of tenancy is inevitable. At present, and as far in the future as it is safe to predict, a considerable percentage of tenancy is a normal, steady condition in American agriculture. But where is the dividing line between the normal and desirable, and the abnormal and undesirable? What factors affect the place of this dividing point? Tenancy in New England averages less than 10 per cent; in New York, about 20 per cent; in Iowa, over 40 per cent.

From the standpoint of the farm as a home, farmers are better off by a considerable margin than their urban neighbors, for only 28.1 per cent of farmers rent their homes, while 60 per cent of all other homes are rented. Considering the farm family as an economic producing unit, almost 72 per cent of the farmers operate their own plants. It would be very difficult to ascertain what percentage of other family units owns and operates their own means of livelihood.

Some effort to throw light on the problem as to just what is undesirable about tenancy has been made during the past few years. Gray, Stewart, Galpin and others of the U. S. Department of Agriculture, together with investigators connected with various state colleges of agriculture and departments of sociology, have made studies of census material, taken surveys of various farm areas in widely separated parts of the United States, and have prepared careful reports, some of which have been published and others made use of in articles for current magazine and periodical publication. These studies mostly concern the effect of tenancy on standards of living and on religious and social life. They are especially definite on standards of living. Three points stand out distinctly in the published theses:

- (1) A considerably larger proportion of the family budget is spent for what are grouped together and called “advancement” expenditures by owner farmers than by tenant farmers.

- (2) Comparatively little difference is found between the budgets of owner farmers and tenant farmers in those studies made outside of the “cropper” farmer area, except as to expenditures for “advancement.”

- (3) In the areas where the “cropper” farmer system is in the majority, the differences in living conditions are

found to be very markedly in favor of the owner in almost every detail.

Among the other facts which have been developed, especially by the studies of Truesdell,² and supplemented by Gray, Stewart and others,³ is one which is of special importance, and which explains why it is inevitable and probably essential that a certain per-

centage of owners who were tenants or farm hands is far larger in the Middle Western states than elsewhere (75 per cent in Iowa in 1920).

Corroborative evidence is found in the following table, showing the percentage of tenants and owners at various ages, and this includes the "cropper" tenants.

PERCENTAGE OF FARM OWNERS AND FARM TENANTS IN VARIOUS AGE GROUPS, 1920 CENSUS

Age Group	Owners	Tenants
Under 25 years	2.3 per cent	12.0 per cent
25 to 34 "	14.5 "	31.1 "
35 to 44 "	24.2 "	26.0 "
45 to 54 "	26.4 "	18.4 "
Over 55 "	32.7 "	12.5 "

centage of tenancy should always exist. It is well known that a large proportion of the owner farmers of the country come to this estate through—perhaps because of—tenancy. A man who buys a farm, when entirely untrained to the work, is at a great disadvantage. Few try it. Most of them fail. Farm owners who succeed have had experience and training either on farms of relatives, or as farmer managers, or tenant farmers with or without the added training in an agricultural college. The census inquiries develop at least a part of the data to show this to be true, and tenancy forms a very important part of it.

The 1920 census shows that 58 per cent of all the farm owners counted in that enumeration had passed through a period of farm tenancy or farm work as wage hands, or both. Of the other 42 per cent it is safe to assume that at least one-half of them had worked on their father's farm or that of a near relative and that a good proportion were the sons of tenants. The per-

It is a good guess that if the number of "croppers" were not included in the computation, the number of tenant farmers in the United States over 55 years old would be well below 2 per cent.

Gray, Truesdell and others carried on this study⁴ to the figures in the 1900-10 census reports, finding almost exactly comparable results. But the study by states shows a wide divergence. Without burdening the reader with the detailed figures, this study showed:

a decreasing percentage of tenancy from age group to age group, a rapid decrease for the northern and western states, and a slower decrease for the southern states with a much larger percentage of tenancy remaining in the age groups⁵

in the southern states.

Studies in the efficiency of tenant farming compared with that of owner farming have been made with some care, and do not indicate a difference as wide or important as is generally attached to this question. In fact the indications are that the better farms,

² Census Monograph IV: *Farm Tenancy in the United States*, Goldenweiser and Truesdell, 1924.

³ *Farm Ownership and Tenancy* (Separate from Year Book, U. S. D. A., 1923), Gray, Stewart, Turner, Sanders and Spillman.

⁴ *Ibid.* 2.

⁵ Census Monograph IV: *Farm Tenancy in the United States*, p. 85.

farms with greater proportion of improved land farms and livestock to land, are in the hands of tenants, as indicated by 1920 census figures.

To summarize, it appears from the general survey of the literature, the studies of census figures and independent research regarding this question that in its chief essence this problem is sociologic rather than economic. In this conclusion my personal experience and observation confirm the literature and research of others. Probably the most serious angle of the problem is that of the "cropper" farmer, and this it is evident is both economic and sociologic. The second serious aspect in the problem is the high percentage of tenancy in certain states outside of the south. In a last analysis, the seriousness of this disappears if the tenant farmers secure a fair proportion of "advancement" factors in their standard of living, and if the evolution from tenant to owner remains at the rate shown by census figures. It is not likely in the period of low prices prevailing since 1921 that this has been maintained, but few statistics are available to show this. The third, and perhaps the nationally serious, problem is: has the progress through tenancy to ownership either been halted or handicapped by other considerations?

There is a matter of national public policy involved at this time which needs both statement and explanation. It is that the ideal of American agriculture differs from that which has been accepted or reached by agriculture in any other land or time. That ideal is a maximum of farm-owning, farm-operating family units with such tenancy as exists maintained for the same purpose as apprenticeship in a skilled trade—the preparation for and the progress into ownership. This American ideal may or may not result in cheapest production or largest net revenue from land. This ideal is for

the land to be in large measure divided into one-family farms with one family to the farm, the farm owned by the head of the family. In adherence to this ideal lies one of the greatest bulwarks of national safety.

At present, however, this future American agriculture, as we conceive it, lies open to attack from three sides: (1) the demand of an overdeveloped industrialism for cheap production instead of good citizenship; (2) economic conditions which are increasing tenancy and retarding progress to ownership; and (3) economic and financial conditions which have brought about a great increase in land mortgage debt, so handicapping ownership that it is no better than tenancy. A fourth attack, of which space forbids consideration but which demands mention, is the tremendous increase in land taxation which already threatens to make ownership a mere mask for tenancy at the will of the public.

INCREASE IN LAND MORTGAGE DEBT

I will close this discussion with a brief survey of the question of the increase in land mortgage debt, because of its intimate relationship to the whole problem of tenancy and ownership. Figures seem to indicate that the interest burden at this time practically equals the rent burden, and the evidence is undisputable that its increase is far more rapid.

For the material now to be used I am indebted to the census figures for 1910 and 1920; to their analysis by Pope;^{*} to his independent studies and data; and also to his unpublished manuscript prepared for the Census Bureau, to which I have had access through the courtesy of that Bureau and the author.

Farm mortgages on owner farms were the subject of definite inquiry in

^{*}Unpublished Census Monograph on *Farm Mortgage Debt in the United States*, Jesse A. Pope.

both the census of 1910 and 1920. Farm mortgages on tenant farms were not listed in either, but have been the subject of an independent study by the Census Bureau. This study was under Mr. Pope's direction. He also conducted a careful inquiry into the amount of inflation of values found in the 1920 farm census figures, and reached the conclusion that the appraisals made at about that time by the Federal Farm Loan Board offered the most accurate index. He found these appraisals were 30 per cent below the census farm values for 1920. In using number, rather than value, of tenant farms, thus far in this paper, I have sought to avoid whatever error might lie in the census values for 1920.

From the data thus made available the following table is presented:

page the exact census figures are used for values, and the census figures and the Pope figures to indicate the amount of mortgage debt on both owned and tenant farms.

It is self-evident what a tremendous increase would be shown if, instead of the census values being used as the basis for these computations, the 70 per cent correction had been applied.

Not only has the mortgage debt risen rapidly, and much more rapidly as shown than farm values in every section of the United States, even on the inflated 1920 level, but in the same decade the mortgage debt has encroached on much land that was free from debt in 1910. I have adapted from the statistics brought together by Pope a graphic chart showing this in some detail. (See next page.)

FARM VALUES AND DISTRIBUTION OF FARM MORTGAGE DEBTS

	1910 (000 omitted)	1920 (000 omitted)	Farm Loan Board Valuation * (000 omitted)
Value all farms	\$34,801,100	\$66,316,000	\$46,421,200
Owned farms	23,823,900	42,529,400	29,770,580
Free from mortgage	14,727,200	23,823,900	16,126,110
Mortgaged	9,096,700	19,492,200	13,644,540
Amt. of mortgages	2,483,400	5,672,200	5,672,200
Tenant farms	10,977,200	23,786,600	16,640,620
Free from mortgage	8,452,500	16,276,300	11,393,410
Mortgaged	2,524,800	7,510,200	5,257,140
Amt. of mortgages	689,300	2,185,500	2,185,500
Total of mortgages	\$3,172,700	\$7,857,700	\$7,857,700
Per cent of mortgages:			
On all land value	9.1	11.8	16.9
On mortgaged land	27.3	29.	41.5

* The figures in this column are obtained by correcting all value figures on land in column two to 70 per cent. No correction is made in amount of mortgage debt.

Like the tenancy figures for the country as a whole, the above figures are not a correct index of what took place in various sections of the United States. In the table on the following

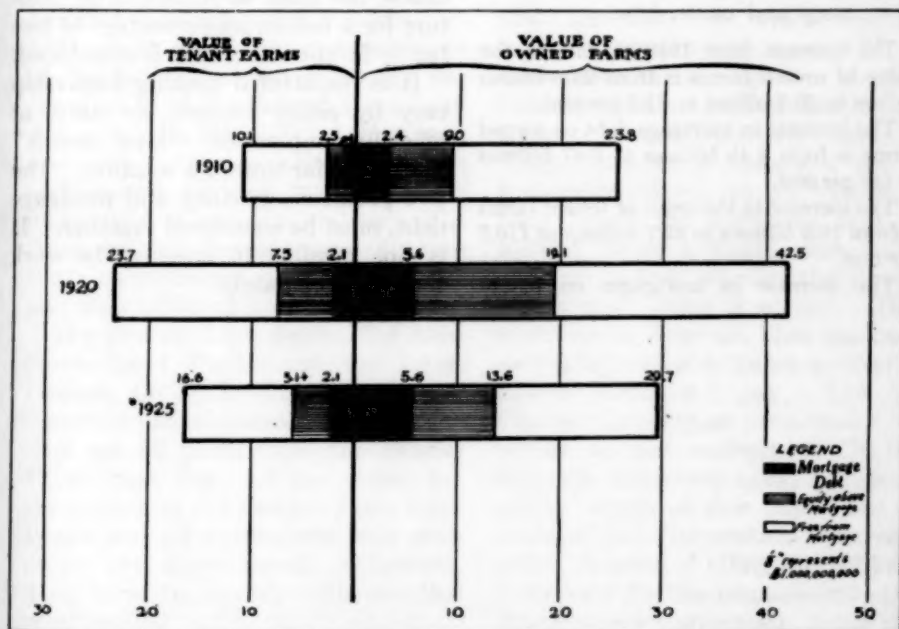
A study of such data as are available seems to indicate that 1924 values can be about estimated on the basis of a 30 per cent reduction from the 1920 census figures for farm values. Since

INCREASE IN LAND VALUES COMPARED WITH INCREASE IN FARM MORTGAGES, 1910 to 1920

Geographical Section	Value	Total Mortgage	Owner Mortgage	Tenant
United States.....	90.6	147.7	128.4	217.1
New England.....	27.7	58	59.2	21.8
Middle Atlantic.....	22.9	33.8	43.7	-0.8*
East North Central.....	63.3	96.1	91.8	110.5
West North Central.....	110.7	160.3	128.8	258.7
South Atlantic.....	109.2	174.3	154.1	229.8
East South Central.....	110.8	199.7	172.9	266.9
West South Central.....	101.8	162.3	146.3	194.8
Mountain.....	139.7	489.4	448.6	858.7
Pacific.....	88.4	215.1	214.5	218.6

* A minus sign (-) indicates a decrease.

Chart showing relationship between value of tenant farms, and owned farms, 1910, 1920, and corrected figures for 1920 values, mortgages on owned and on tenant farms, and value of land subject to mortgage debt and free from mortgage debt.



*Corrected to 30% Depreciation in Farm Land Values.

January 1, 1920, there has been a tremendous increase in the amount of farm mortgages in the United States, but statistics are not available, and will not be available until the January 1, 1925, agricultural census figures are collected, tabulated and made ready for publication. That such a census is about to be taken is a matter for congratulation.

It is not possible to even approximate the increase in mortgage indebtedness in the past five years. In the corn, wheat, hog and range country, it will certainly amount to large figures. These figures are needed to bring this picture to its present color, without making any allowance for the increase in mortgages since 1920. But using the corrected figures for farm values, the following data are the final convincing proof of the gravity of the mortgage problem as affecting the trend of tenancy and ownership.

The increase from 1910 to date in the value of owned farms is from 23.8 billion dollars to 29.7 billion or *24.8 per cent.*

The increase in mortgage debt on owned farms is from 2.48 billions to 5.67 billions or *128 per cent.*

The increase in the value of tenant farms is from 10.9 billions to 23.7 billions or *116.7 per cent.*

The increase in mortgages on tenant

farms is from 689 millions to 2.18 billions or *217.1 per cent.*

We need studies on the influence of farm mortgages, as well as of farm tenancy, on the standard of living in farm homes. The figures show that a tenant farmer, outside of the "cropper" class, is more likely to become an owner, than an owner with a mortgage is to become a free unmortgaged owner.

The operators of farms valued at 65 per cent of all the farm values in the United States were paying either rent or interest on all or some part of their land in 1920. In 1910 this was the lot of only 57 per cent. In that period tenancy had increased only 3.8 per cent. The remainder of this increase is accounted for by the increase in amount and area of mortgage debt. The two subjects together constitute one of the most pressing national problems—unless the ideal of American agriculture for a maximum percentage of free family farm-owning units is abandoned.

It is doubtful if making ownership easy by either Federal, or state, or officially supervised "land credit" plans goes far toward a solution. The two problems, tenancy and mortgage debt, must be considered together. It is not possible to successfully work them out separately.

Agricultural Credit Facilities—Are They Ample?

By A. D. WELTON

Continental and Commercial Bank of Chicago

THE banking organization of the United States has undergone radical changes since 1913. The first step toward a scientific system was the passage of the Federal Reserve Act, December 23, 1913. This Act has been amended in several instances, but so far as its great purpose is concerned, the amendments are important only in aiding to achieve it. That purpose, whatever the wording of the preamble of the law, was to create an elastic currency and to give the country a system of true reserve banking.

The Reserve System, designed as an aid to business, has been of benefit to the farmer, who is also a business man, just as it has been of benefit to all other men engaged in business.

The next step in the reorganization of the nation's credit machinery was the passage of the Federal Farm Loan Act on July 17, 1916. This Act has been amended on three occasions. The first and second touched minor matters necessary to practical operations. The third, in 1923, brought into existence the so-called Intermediate Credit Banks and their affiliated institutions.

The Federal Land Banks, the Joint Stock Land Banks and the Intermediate Credit Banks, with the co-operative financial associations authorized, are all products of the Federal Farm Loan Act. All are under the supervision of the Federal Farm Loan Board and all do business only with or for the direct benefit of farmers. They have to do only with so-called rural credits.

EMERGENCY MEASURES

Other financial machinery has been set up in the meantime and has been

brought into action to improve financial conditions in the agricultural districts. It is, however, emergency machinery and will probably pass out of existence in the near future. It is interesting as showing the concern of government and bankers over a condition of localized distress and is valuable as illustration of what could be set up at any time by law or by voluntary action in an emergency.

The first agency calling for consideration is the War Finance Corporation, organized during the war for no reason that experience with it has justified. It performed no services of particular value during the war but, in the efforts of its sponsors and directors to find something on which it could function, opportunity came with the depression in the spring of 1920. Country banks, having farmer customers, were particularly hard hit. They called their loans and not infrequently offered as an excuse for their action the statement that the Federal Reserve Banks were calling on them to pay, whether the Reserve Banks were doing it or not. There is no doubt, however, that the banks were filled with slow paper, or that the farmers could not pay. The War Finance Corporation performed a real service in that emergency. It took from the distressed banks millions of dollars' worth of slow paper, but the losses of the Corporation were negligible. Instead of piling up bad paper in its portfolio, the management of the War Finance Corporation made sure, through the processes of renewal and substitution, of having the best sort of collateral. The Corporation got the cream and the borrowing banks

kept the skimmed milk. Banking, with the War Finance Corporation, was strictly business and entirely devoid of eleemosynary trimmings.

In the emergency of 1924 the Intermediate Credit Banks performed some service and a voluntary organization composed chiefly of New York, Chicago and Twin City bankers went to the rescue, also in a strictly business way.

It is unlikely that any such emergencies will recur. If they should, they would doubtless be met in similar ways, but probably not by the War Finance Corporation whose charter will soon expire by limitation.

These unusual methods are likely to become as obsolete, in the near future, as the Aldrich-Vreeland Emergency Currency Act, or the older method whereby the Secretary of the Treasury made deposits of public funds in banks "for crop-moving purposes." Under the old banking scheme that was the popular way of returning funds, which the government collected regardless of its needs, to commercial channels. Often such deposits were well made and often they had a strong political odor. The practice survived the establishment of the Federal Reserve Banks, but not long. Once those banks were in full operation such conduct became patently political and it just naturally curled up and died after "crop-moving funds" were deposited in the banks of Washington, D. C., to relieve the distress of savings depositors in a bank on the verge of insolvency.

PERMANENT AGENCIES

For the farmer, then, since 1913, the following banking agencies, sound in form and design and permanent in character, have been authorized and established:

The Federal Reserve Banks.
The Federal Land Banks.

The Joint Stock Land Banks.
The Federal Intermediate Credit Banks.

RESERVE SYSTEM PRIMARILY COMMERCIAL

As was stated previously, the farmer is participant in the benefits of the Federal Reserve System. The farmer is a user of commercial credits and, indirectly but not less truly, he benefits from the order, precision and certainty that the Reserve System brought to commercial banking. The financing of the cotton crop, the movement of the grain crops, the installation of acceptances, the assurance of ample supplies of currency were matters to which the framers of the Reserve Act and the supervisors of the System gave early and earnest study.

Considered in its relation to the farmer it must be remembered that the Federal Reserve System is frankly a scheme of commercial banking and nothing else. It can make only short time loans against the security of commodities or merchantable goods. The making of loans against government bonds and securities is really a distortion of the purposes of the Act. There were scant amounts of such securities in existence when the Act was passed. The war and its financial consequences were beyond the contemplation of the framers of the Act. Loans secured by government war obligations were the result of war financing and the sooner they disappear the better it will be. However, nothing is clearer testimony of the efficiency of the Reserve System than its proved capacity to carry this burden and at the same time meet the requirements for commercial credits.

RESERVE BANKS AND DEFLATION

Any discussion of the operations of the Federal Reserve Banks in relation

to the farmer would be incomplete without reference to the assortment of wild charges and allegations about its "deflation of the farmer." Those charges and allegations have been reiterated in the face of the facts and the figures. In the liquidation that began in the spring of 1920, the farmer suffered in common with all business men, perhaps no more, perhaps a little less.

The charges are that the Federal Reserve Board, under some prompting of ignorance or malice or both, forced deflation and made no effort whatever to ameliorate the farmers' woe.

The facts are that neither the Federal Reserve Board nor the Federal Reserve Banks did any such thing. Both loans and Federal Reserve notes were expanded and again expanded during the period of distress. The peak of the expansion was reached after the period of depression had been under way for a number of months.

The fiercest criticism of the conduct of the Reserve Board and Reserve Banks has come from Iowa. The borrowings of Iowa banks, members of the Reserve System, reached their peak in January, 1921, and had advanced steadily to that peak from the February preceding. Between May 15 and December 11, 1920, the price of Iowa corn declined \$1.38 a bushel, but the loans to Iowa banks expanded \$33,142,000 in the same period. While the price of Iowa hogs was declining 44 per cent between September 20 and December 11, 1920, loans to Iowa member banks expanded 37 per cent. The figures could be given for other commodities, but those cited show that it was the policy of the Reserve Banks to give all assistance possible. And they did in fact give such assistance.

The case cannot be fully stated, however, without considering the finan-

cial burden that was placed on the Federal Treasury by the war and the policy of the officials in charge. The Reserve Board was under great and constant pressure from those officials. The belief now is that the Federal Reserve Board would have been glad to take steps early in 1919 to check inflation and, had it done so, it would have avoided some of the deflation which was certain to come and did come a little over a year later.

By the middle of 1919—after the sag in business the first two months of the year and the precipitate rise immediately following—most economists and some business men and bankers felt that the inflation which was plainly under way should be checked. The most effective warning and preventive, they agreed, would be a moderate increase in rediscount rates. These far-sighted observers felt that an ounce of prevention was necessary. But it is an open secret that the Treasury Department felt differently.

The Treasury wished to keep up the price of Liberty Bonds, which meant keeping interest rates down. To keep interest rates down it put pressure on the Reserve Board to keep rediscount rates down. It disregarded the opinions of the ablest students of business and banking. Inflation swept on unchecked.

On November 3, 1919, after speculation in Wall Street had reached its peak, the New York Reserve Bank raised its rediscount rate from 4 to 4½ per cent. It was not until February of 1920 that the rediscount rate on 90-day paper was raised from 4½ per cent to 6 per cent by the New York Reserve Bank. On May 29, it was raised to 7 per cent. By that time inflation had gone so far that the drop into depression had begun. It was the old story of locking the stable after the horse had been stolen. Mr.

Benjamin Strong, Governor of the Federal Reserve Bank of New York, has virtually admitted this to be the case in his testimony before the Joint Commission of Agricultural Inquiry (pp. 502-503):

Governor Strong. Through all of that period our policy was necessarily affected by the necessities of the Treasury, but on the other hand, I believed then, and I believe now, that the basis, the fundamental basis of restraint upon speculation rests upon the cost of credit, and that the policy of raising our rates was necessary and justified, and without the adoption of that policy this expansion which took place would have gone to unparalleled levels.

Senator Lenroot. Then leaving out of the question for the moment the necessities of the Treasury, if this action had been taken directly following the Armistice we would have been much better off? Or I may put it this way: As soon as it was apparent that this wave of speculation was on, following the Armistice, if this action had been taken we would have been much better off?

Governor Strong. Well, sir, I wish I might answer that question directly and categorically, but it is an exceedingly difficult one to answer, Senator.

Senator Lenroot. Well, if it had the effect in December, 1919, that you say, would it not have had the same effect earlier without reaching these high levels?

Governor Strong. Yes; but it might have had very much more unfortunate effects in other directions.

Senator Lenroot. I was leaving out of consideration the Treasury for the moment.

Governor Strong. If you leave out of consideration the Treasury—and that is, of course, a most exceedingly important consideration, affecting the welfare of the country—

Senator Lenroot. Yes—

Governor Strong (continuing). I should say that an increase in discount rates at the period when the decline was suffered, from January to March of 1919, to which I have referred—

Senator Lenroot (interposing). Yes; that is what I mean—

Governor Strong (continuing). Would have been as close to an ideal 100 per cent policy of perfection as could have been adopted.

Senator Lenroot. Then, looking back—and hindsight is always better than foresight—would it not have been better to have paid a higher rate on our Treasury obligations and put in that policy back in 1919?

Under this interpretation of conditions there may be a division of responsibility but, in any event, the Reserve Banks are exculpated even if the Reserve Board erred in yielding to the Treasury and the Treasury erred in its desire to keep down interest rates on its obligations. In any event the farmer, however disastrous the consequences to him, merely bore a share of the common burden.

FARM LOAN ACT EXCLUSIVELY AGRICULTURAL

The Federal Farm Loan Act has no purpose at all except to help the farmer. So far as may be, it points the way to a solution of the problem of investment banking for the agricultural sections. It has, of course, made inroads on the business of the private lenders on farm mortgages, but these concerns still do the greater part of the business.

The farm mortgage indebtedness on farms operated by their owners was placed at four billion dollars in the census figures of 1920. These mortgages were divided into classes according to lenders as follows:

Owned by insurance companies	\$1,000,000,000
By savings banks, trust companies and local banks.....	1,000,000,000
By institutions, endowments, etc.....	300,000,000
By private individuals.....	250,000,000
Local loans, real estate contracts, etc.....	1,450,000,000

Recently the total farm mortgage indebtedness was placed at nine billions by a statistical bureau. From the time of their organization until October 31, 1924, the Federal Land Banks had made 332,907 farm loans, aggregating \$1,019,444,148. The 66 Joint Stock Land Banks had made 61,500 loans aggregating \$478,326,855. The total number of loans made by these agencies, therefore, was 394,407 as of October 31, 1924. The total amount of these loans was \$1,497,771,003, or about 16 per cent of the nine billion dollar total mortgage indebtedness.

Omitting the sentimental and altruistic arguments with which the discussion of every rural credit scheme is heavily charged, it is interesting to note that the average life of a farm loan made by loan brokers is about four years. Under the old plan there were in renewals and new loans every year not less than one billion dollars in mortgages on which commissions and expenses of various kinds were collected by the local agents. Such costs often amounted, as determined by careful estimates, to \$50,000,000 a year.

Under the old order the greater part of what are termed "commercial mortgages" passed through from two to ten hands before reaching the final investor. Each of them took his toll and the toll was governed only by the necessities of the borrower.

It has been said that there are 6,000 mortgage dealers in the United States. If country lawyers, land brokers and any one who hangs out a sign, "Money to Loan on Farms," are all counted, the estimate is perhaps correct, but it is doubtful if there are 500 individuals and concerns in the country whose financial standing, experience and integrity are sufficient to warrant the confidence of the public.

Long before the Federal Farm Loan Act was passed, the short term farm

mortgage as an instrument of credit had outlived its usefulness. It may have had a fair place in the financial scheme in the early days but, although based on the soundest of values, it never became a liquid asset in the hands of the investor. It could be sold if it chanced that the owner could find some one who wished an investment of that kind for that amount at that time. And the investor living hundreds of miles from the farm could have no personal knowledge of the security. There were no rules, no supervision; the investor was dependent on the mortgage dealers or loan agents and their integrity might be dulled by their interest in making sales. Of course there were cases of forgery, duplication of mortgages, misapplication of funds, etc.

Under such circumstances the farm mortgage could have no assured position in the investment field. And the farmer-borrower was always at a disadvantage. He was compelled to sign obligations which he knew he could not meet at maturity and to submit to all sorts of exactions. By a system of overlapping mortgages and mixed maturities it was possible to split up a sizeable mortgage on a good farm so that its owner would always be at the mercy of the loan agent.

One of the evil influences of this system, and it was a system despite the number of reputable and responsible concerns in the farm loan business, was the refusal of thousands of tenant farmers to continue in the business of farming. Another influence was to tempt competent and experienced farmers into land speculation. They knew they could never meet the loans on the terms laid down; they counted, therefore, on selling the land they had mortgaged. Their best efforts were given to putting land in condition to sell that they might make a profit as large and

as soon as possible. Their local interests were negligible or fleeting and they were ready to move on very short notice.

It is not surprising that the Federal Farm Loan Act stated as its purpose "to provide capital for agricultural development," not in the interest of any class but for the benefit of the whole nation. It was intended to correct the evils and the maladjustments wrought by the old system. This was to be accomplished not only by providing another method of borrowing but, by competition and by example, to force the old system to correct its ways and eliminate the abuses.

Interest rates, commissions and the expenses of making loans were therefore reduced, eliminated or made certain. Investigations and appraisals were systematized. Through organization of co-operative associations, membership in which was necessary before application for a loan could be made, and compulsory ownership of land bank stock by a borrower, neighbors were interested. Supervision by the Federal Farm Loan Board added a new assurance and, most important of all, the issuing of bonds against mortgages deposited with that Board provided desirable securities in convenient denominations for the investment market. Moreover, the amortization of loans by convenient payments over a period of 33 years gave borrowers assurance of rewards for permanency. Farmers were to be left the task of conducting the business of farming.

An opening was left for responsible and experienced farm loan men to continue in business under the new scheme by organizing Joint Stock Land Banks. Thus new and better agencies for making loans on farm mortgages were devised and the old ones were to be put on their mettle if they were to survive.

DIFFICULTIES OF FEDERAL LAND BANKS

It would be beyond the realm of practical banking if such a scheme of lending money could be brought into existence without troubles or could be got into operation without grief. The troubles indeed were many and the griefs disturbing. The Federal Farm Loan Board was made a bureau of the Treasury Department. This was a departure from precedent because the Federal Reserve Board is an independent organization. Whether this was fortunate or unfortunate, it opened the door for accusations of paternalism and class favoritism. The Federal Land Banks were barely under way when the nation became involved in the war. The country's financial power was being tested and, in the face of entire newness and some opposition, the first issues of farm loan bonds met with scant favor.

The Treasury was given authorization to buy them as it was also authorized by the law to provide the capital for the Federal Land Banks. Of the original \$9,000,000 stock of the twelve Land Banks the Treasury still holds \$1,670,000 and on July 31 last it still owned \$101,000,000 of bonds. The Federal Farm Loan Board is still confronted by the task of ridding the Treasury of these securities.

Naturally political difficulties were plentiful. Many members of Congress saw or thought they saw in the Federal Land Banks an opening through which other paternalistic schemes could be passed. There was a great coterie of public men and agricultural leaders who were blind to the fact that financial institutions must be conducted according to sound banking principles. They had been swayed by the arguments that the Federal Land Banks were some kind of charitable enterprise

and, by magic or mystery, could make loans to insolvents with safety. In all such plans there are promises in the preliminaries that lose their flavor in the practice. The conduct of the Federal Land Banks, or any banks, leaves no room for sentimentalism.

The old farm mortgage men were annoyed by the new order and annoying to it. They were particularly concerned over the exemption of the bonds of both Federal Land Banks and Joint Stock Land Banks from taxation. The Farm Mortgage Bankers Association has been the most active and persistent advocate of legislation that would change this or a constitutional amendment that would forbid it. Superficially it may seem unfair, but there is so much to be said against a change that, as yet, none has come. And it may be doubted if a change ever comes. When the law says that the loaning bank may not charge on its mortgages a rate of interest "exceeding by more than one per centum the rate of interest established for the last series of farm loan bonds issued by them," and the payment of the bonds is guaranteed by all their resources, there must be some inducement held out to bring capital to such enterprises. The only compensation the government could offer was to have the bonds tax-exempt. There may be some other way but it seems not to have been suggested. Under our imperfect tax laws, farm mortgages are not declared for taxation. If they were, no one could afford such investments. It is part of the business of the loan broker to assist his client to evade taxes. But this broker or lender is the most vociferous opponent of tax exemption for bonds issued by Federal Land Banks and Joint Stock Land Banks.

LEGAL STATUS OF JOINT STOCK LAND BANKS

The Joint Stock Land Banks were off to a bad start. The first one was organized at Sioux City, Iowa, April 4, 1917, less than a year after the passage of the Act. Between that date and December 4, 1919, thirty-one Joint Stock Land Banks were chartered. Charter No. 32 was granted to the Columbus, Ohio, Joint Stock Land Bank, February 23, 1922. In the meantime came the legal test.

There were early doubts of the constitutional power of Congress to set up any kind of banking system or banking machinery. The point was settled in the cases of *McCulloch v. Maryland* (4 Wheaton 316) and *Osborn v. Bank* (9 Wheaton 738) by Chief Justice Marshall, who found authority for such action by Congress in the broad general powers conferred by the Constitution upon the Congress to levy and collect taxes, to borrow money, to regulate commerce, to pay the public debts, etc.

The makers of the Federal Farm Loan Act anticipated legal proceedings by making the Federal Land Banks government depositaries and their bonds the instrumentalities of the government. However, a suit was brought. It was claimed that the Federal Farm Loan Act was beyond the constitutional power of Congress.

A decision was handed down by the United States Supreme Court in February, 1921, affirming that of the District Court of the United States for the Western District of Missouri.

After that decision the organization of Joint Stock Land Banks proceeded with some rapidity. Forty were organized in 1922 and nine in 1923. Six have been liquidated, one is not operating and there have been several consolidations.

MANAGEMENT OF FEDERAL LAND BANKS

If the management of the Federal Land Banks has been as faulty as its hostile critics declare, the evidence must be found outside the statistics. Anything new is likely to show defects. There is usually a wide spread between what the law authorizes and what is learned from experience. It was a reasonable expectation that politics would handicap operations in the first stages of practice, but it is true that the percentage of the amount of loans made by the Federal Land Banks to those foreclosed has been less than three-fourths of one per cent. In the Joint Stock Land Banks it has been about one-half of one per cent. Among life insurance companies which make farm loans the percentage is much smaller, in several cases as low as 5-1000 of one per cent.

INTERMEDIATE CREDIT BANKS

However, the friends of the farmer were not satisfied to solve his investment banking problems by the Federal Farm Loan Act and his commercial banking problems by the Federal Reserve Act. They insisted that the farmer still had inadequate credit facilities. Whenever the farmer is in a bad way, the cause for it is not sought in drought or flood or plant disease or cattle disease, but in the credit field. Lack of credit, usually credit to the insolvent or half solvent, is held the cause of all the farmer's ills. If, by any chance, it isn't the cause, it is always the remedy. So the Federal Intermediate Credit Banks came as the result of an amendment to the Federal Farm Loan Act, entitled the Rural Credits Act of 1923.

Even a casual reading of this Act shows that the Intermediate Credit Banks are similar to the War Finance

Corporation in scope and method of operation. In other words, the Intermediate Credit Banks carry over into the permanent agricultural credit machinery the facilities offered by the emergency legislation, Section 24 of the War Finance Corporation Act. This was known as the agricultural credits section.

Loans may be made by the Intermediate Credit Banks for not less than six months or more than three years' duration. Loans by the War Finance Corporation could have the same life.

Loans may be made by the Intermediate Credit Banks to banks, trust companies and co-operative associations—to substantially the same organizations that the War Finance Corporation made loans.

The capital stock of the Intermediate Credit Banks "shall be subscribed, held and paid by the government of the United States." In other words, the capital is furnished by the government, just as it was in the case of the War Finance Corporation. Each of the twelve Federal Intermediate Credit Banks has an authorized capital stock of \$5,000,000.

It is unnecessary to give further details about the Intermediate Credit Banks. The points of similarity to the agricultural credits section of the War Finance Corporation are striking. The latter was passed to take care of "frozen" agricultural credits that could not properly be carried by the Federal Reserve Banks, because that would have destroyed the commercial character of these banks.

Those students who have contended that the commercial character of the Reserve Banks should not be impaired by having grafted on to the Reserve Act an amendment requiring loans of an investment, or semi-investment nature, can find relief in the fact that the Intermediate Credit Banks have re-

moved this danger. Moreover, there is doubtless a need for just this sort of banking, which is not strictly commercial and yet is not in the same class as the mortgage loan business.

The twelve Federal Intermediate Credit Banks, on November 29, 1924, had direct loans outstanding to the amount of \$44,258,748. Rediscounts were listed as follows:

Agricultural Credit Corporations.	\$10,841,735
National Banks.....	28,696
State Banks.....	875,242
Livestock Loan Companies.....	7,443,029
Savings Banks and Trust Companies.....	175,444
Co-operative Associations.....	.....
Total	\$19,364,746

The total of direct loans and rediscounts was \$63,623,872, a relatively small amount as compared with the loans of just one of the largest banks in the Middle West.

CURRENT ASSUMPTIONS

The Federal Intermediate Credit Banks came into legal existence as the result of a pair of theories. One is that the ordinary banks in the agricultural districts cannot give long term credits. The second is that the term of paper eligible to rediscount by the Reserve Banks is too short for the farmer. The former will remain a theory until actual figures have been obtained not only

from those who complain about not getting long term credits, but from those who meet or wish to meet their notes when due. Too much in regard to credit to farmers has been taken for granted; too much of the gossip which passes for information has come from the political friends of the farmer.

The conditions which mark paper as eligible for rediscount at the Reserve Banks have always been the subject of heated argument. The initial mistake was in fixing any term as a condition to eligibility. In practice the average maturities of paper rediscounted marks the character of the business done in the Reserve District. It is shortest usually in the Boston District and longest in Minneapolis. If the maturity of paper offered for rediscount were stricken from the law and officials of the Reserve Banks were to use their discretion in accepting paper offered, the average maturities would probably stand about where they do now.

There will probably be more rural credit legislation and perhaps further development of the Intermediate Credit Banks. There are many students of the farm credit situation who have concluded that the greatest reform would be the adoption of the Chinese custom of paying all current debts once a year. Such a scheme would perhaps be more beneficial to the farmer than to keep him eternally at Ixion's task.

Farmers as Managers¹

By W. M. JARDINE

President, Kansas State Agricultural College

FARMING is a complex business. Many forces, some of which the farmer can control, others of which he cannot control, enter into it. Managerial ability in farming consists in controlling the controllable forces and adapting the farm business to the uncontrollable ones.

The farmer must exercise managerial ability from the time he starts the farm enterprise. He must decide the quantities of land, labor and capital to be combined in the farm business. This constitutes organizing the business. In organizing it he not only determines the size of unit to be operated but chooses the enterprises to be included. These enterprises are crops and livestock.

Following the organization of the business comes the problem of operating it efficiently. In operation the farmer seeks to secure the most efficient production of crops and livestock and to dispose of these products advantageously.

In both organization and operation of the farm business the farmer is confronted with the problem of securing the funds needed for these purposes. This is his finance, or credit, problem.

The success attained by farmers is in proportion to the wisdom they exercise in organizing their business—that is, in choosing the combination of land, labor and capital and in devoting these resources to the production of

crops and livestock. A proper start means as much in farming as in any other business and efficient operation is rewarded in proportion to the size of the business unit fully as much as in any other industry.

I. ORGANIZING THE FARM BUSINESS

In organizing the farm business the farmer chooses land, labor and capital and then apportions these resources to the production of various kinds of crops and livestock. There is abundant evidence that farmers are using managerial ability in the organization of their business.

Choosing Land

In choosing land farmers who own more land than they wish to operate are subletting some of it. Other farmers who do not own land or who do not own as much land as they wish to operate are leasing from landowners. In 1920, 8.7 per cent of all farmers in the United States owned some land and rented additional land; 38.1 per cent did not own any of the land which they operated, but rented all of it. In 1920, two and a half million tenant farmers were farming 35 per cent of the improved farm land in the United States. An apprenticeship in farming, as a tenant, is one way to land ownership. A tenant must exercise a high type of managerial ability in order to pay for his farm. Once the land is his, there is little chance of his losing it if he knows how to handle his business. On the other hand, many young men inherit farms. Often they lose the farms acquired by inheritance simply because they do not have the ability to

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farm efficiently; in other words, managerial ability.

Experience has demonstrated that the medium large farm can be more economically and efficiently operated than the smaller farm. The changes as a result of renting land are one indication of farmers' recognition of this fact. A further indication of such recognition is found in the movement toward larger farms. In 1910 the average farm in the United States contained 138.1 acres. In 1920 it contained 148.2 acres. The improved area per farm increased from 75.2 acres to 78.0 acres. In the corn and wheat belts, which are the heart of the agricultural section of the United States, the change toward larger farms was even more striking. In the West North Central group of states, which includes Minnesota, Iowa, Missouri, North and South Dakota, Nebraska and Kansas, the average farm contained 209.6 acres in 1910, 234.3 acres in 1920. The size of farm in this section of the country has steadily increased since 1880, when the average size was 142 acres. In Iowa the average size was 133.5 acres in 1880 as against 156.8 acres in 1920. In Kansas the size has increased since 1870, when the average farm comprised 148.0 acres, until in 1910 it contained 244.0 acres and in 1920, 274.8 acres. From 1910 to 1920 the improved acreage per farm in Kansas increased from 168.2 acres to 185.1 acres.

Choosing Capital

In choosing the amount of capital to invest in the farm business, many farmers borrow funds. Other farmers have surplus funds to lend. In either case the amount of capital in the business is being adjusted to the needs of the business as understood by the operators. Thus managerial discretion is being exercised.

In recent years improvements have been made in the credit facilities available to farmers. The Federal Land Banks and the Intermediate Credit Banks are providing farmers with types of credit that more nearly meet the needs of the farm business. Farmers have taken advantage of these facilities. The influence of the Federal Land Banks on the credit situation has been notable. This influence would not be felt if farmers were not alert, as managers, to take advantage of this improved opportunity to secure credit. In addition to borrowings from these strictly agricultural credit institutions, farmers are utilizing the Federal Reserve System. On June 30, 1924, the Federal Reserve Banks held more than \$86,000,000 in agricultural and livestock paper. In addition farmers were undoubtedly borrowing much more from their local banks on paper that had not been discounted with the Federal Reserve Banks.

Employing Labor

In hiring labor executive functions are likewise exercised. Farmers employ laborers if needed. Some farmers sell their services during a portion of the year because they do not need the time for their own business. The smallness of the individual farm unit makes its labor problems less than those of industrial plants. There is abundant evidence, however, that the farmer plans his labor and manages it efficiently. Most of this evidence pertains to the operation of the farm business and will be considered later.

There is a high degree of fluidity of land, labor and capital in farming. These factors of production tend to flow to those farmers who have ability to use them to advantage; that is, to those who take into account the factors fundamental in the organization and operation of a successful farm business.

CHOOSING CROPS AND LIVESTOCK

The second problem in organizing the farm business consists in choosing the crops and livestock to be produced with the land, labor and capital included in the business. Since the World War farmers have been confronted with a gigantic problem in choosing enterprises. Enterprises that were profitable during the war became unprofitable after the war. Farmers have adjusted themselves to these changed conditions. The following statement by the U. S. Department of Agriculture, issued on June 1, 1924, pays a deserved tribute to the expertness of farmers in adjusting their business policies:

The community at large hardly understands how far-reaching and skillful a readjustment farmers have made in the major lines of production. They have obeyed economic signals as expertly as any industry ever did. Only, this takes time in agriculture; no board of directors can shift overnight the cropping system and growing animals on six million farms.

In making these adjustments the farmer is choosing those enterprises that will give him maximum utilization of his resources consistent with the profits capable of being derived from their use. He considers his fixed resources in terms of land owned, buildings erected, equipment on hand, and labor available. Often he makes changes slowly—a wise policy, since abrupt changes might result in undue loss, such as inability to use buildings and equipment on hand.

Many farmers endeavor to utilize their resources to the fullest possible extent throughout the year. The distribution of labor is being given more and more attention by farmers. The increase in dairy cattle and in the production of dairy products is abundant evidence of the farmer's attempt to

secure a better utilization of his labor and a better market for bulky and waste feeds produced on the farm. The number of milk cows two years old and over on farms in the United States increased 6 per cent during the year ending June 1, 1924. In the West North Central states the increase was 8.8 per cent. In this, the wheat growing section of the country, the turn to dairying illustrates the degree to which farmers are endeavoring to improve their situation by choosing those enterprises which are relatively more profitable. A further illustration is the reduction of wheat acreage in the United States from 75 million acres in 1919 to less than 54 million acres in 1924.

For many years the farmers' managerial ability has been in evidence in the adoption of new crops as soon as they were definitely shown to be superior to the old ones. Alfalfa is an example. In 1909, 4,707,146 acres of alfalfa were grown on 283,012 farms in the United States. By 1919, there were 8,624,811 acres on 542,549 farms. Kafir was introduced into the Middle West about 1885, milo at some time prior to 1900. These crops soon proved their value and farmers adopted them, growing 1,635,153 acres in 1909 and 3,619,034 acres in 1919. Sudan grass, primarily a hay and forage crop, was introduced into the United States in 1909. By 1923 Kansas farmers were growing 156,718 acres of this crop. The significance of this figure is appreciated more fully when it is realized that few farms grow more than ten or fifteen acres of this crop, while many grow less than five acres.

Another outstanding instance of managerial ability displayed by farmers is found in the increase in acreage of alfalfa, one of the crops heretofore mentioned, in the last twenty years in the North Central portion of the

United States. It was formerly thought that alfalfa could not be successfully grown in Wisconsin, Michigan and other northern states. As dairying developed in this region, great quantities of alfalfa hay were shipped in from western states for feed. The increase in freight rates on alfalfa increased the price of hay in this territory to a point where it could not be fed at a profit. The northern experiment stations, however, demonstrated that it was possible under their conditions to grow alfalfa successfully on many types of soil by using inoculation, lime and phosphatic fertilizers together with hardy strains of American-grown seed. The application of this information by the farmers of Michigan, Wisconsin, Minnesota and other states has resulted in the growing of alfalfa on an extensive scale. In Wisconsin, for example, there were 18,000 acres of alfalfa in 1909. In 1919 the acreage had increased to 62,000 acres; in 1921, to 121,000 acres. It is estimated that now, in the fall of 1924, the total acreage of alfalfa in Wisconsin is approximately 400,000 acres.

The introduction of Brahman cattle is responsible for a large and successful cattle industry in the Gulf Coast region, particularly in Texas. Brahman cattle are highly resistant to Texas fever, which causes heavy losses among beef and dairy cattle. The Brahman cattle themselves are not good beef animals but the first cross as well as the later crosses carry the beef qualities of the American breeds. These crosses retain resistance to Texas fever, though in less degree than the pure Brahman. It is therefore the common practice of cattle men to use pure Brahman bulls in herds of one-half, one-fourth, and one-eighth Brahman cows.

In organizing their farm businesses and in selecting the enterprises to be

included in them, farmers exercise a high degree of managerial ability. This is not all of their problem, however. After determining on the farm organization both with reference to the size of the unit in terms of quantities of land, labor and capital to be included, and upon the enterprises to be grown with these resources, the farmer must conduct his business from day to day. This, the field of farm operation, presents still further opportunities for the farmer to exercise managerial ability.

II. FARM OPERATION

Farm operation consists in the production of crops and livestock and the disposal of these products. It involves selection of varieties, methods of cultivating the soil and caring for the crops, selection and breeding up of animals, methods of feeding, managing and caring for these animals, means of plant and animal disease control, day-to-day management of farm resources, such as labor and equipment, and marketing of the products. In the operation of their business farmers have not been slow to take advantage of improvements that would result in greater returns.

IMPROVEMENTS IN CROPPING PRACTICES

Unless the land produces good yields of high quality it is out of the question to try to farm in these days of high-priced land—and the days of cheap land are gone. Farmers can no longer succeed with out-of-date practices. Many illustrations may be cited of improvements made by farmers in these respects. If it seems that emphasis is placed upon the improvements made by Kansas farmers, it should not be assumed that in other parts of the United States the farmers have not likewise been improving their

farm business; illustrations from Kansas are used simply because the writer is most familiar with them.

Eighteen years ago experimental work in the preparation of the wheat seedbed was started by the Kansas Agricultural Experiment Station. The results of these experiments showed conclusively the value of early deep plowing. Farmers have taken advantage of the results of these experiments, are plowing deeper and preparing the seedbed for wheat much earlier, and are securing higher yields as a consequence.

Fifty years ago the farmers of the hard winter wheat belt were planting spring wheat and soft wheat. Early records show that large acreages of spring wheat were sown—even in the eastern part of the hard winter wheat belt—as late as 1880 with losses that may be easily imagined when one is reminded that in experiments at Manhattan, Kansas, the average yield of spring wheat for eighteen years is only 8.7 bushels per acre on ground that in the same period produced an average of 32 bushels of winter wheat to the acre. In a similar experiment at Hays, Kansas, for twelve years spring wheat produced 4.8 bushels per acre and winter wheat 17 bushels per acre. In a twelve-year test at Manhattan, Turkey, a variety of hard winter wheat outyielded Fulcaster, one of the best soft wheats, by nearly five bushels per acre, while Kanred, a new strain of hard winter wheat, in the same period outyielded Turkey in turn by three and one-half bushels per acre. Today, Kansas farmers have abandoned spring winter wheat, and of the latter they are growing the hard varieties that produce the highest yields.

In the South certain discoveries and scientific factors have had decided influence on the agriculture in certain regions. For example, the development of

Blue Rose rice, which was first offered to growers about 1914, was so favorably received that within five years it became the leading variety in Texas and in the prairie rice section of Louisiana. It is thought by many that the introduction of this variety has made possible the continued profitable production of rice in this part of the United States.

Control of Insect Pests

Farmers are controlling insect pests and plant diseases that formerly reduced materially the profits in farming. The average yield of potatoes in the Kaw River Valley of Kansas for the years 1914-16 was 97.9 bushels per acre. Because of plant diseases, the yields dropped so that the average yield for the years 1917-19 was only 88.4 bushels. The growers of potatoes turned to their Agricultural Experiment Station for help. Control measures based on experiment and recommended by the station are now followed by many of the potato growers in this region. Sixty-five per cent of the commercial acreage is now planted with treated seed. In 1920-23 the average yield was 108.5 bushels per acre.

Insects are limiting factors in crop production and farmers are taking advantage of control measures discovered and developed through experiment by specialists. Among the insects particularly injurious to crops in the Great Plains area are the Hessian fly, chinch bug and the grasshopper. A program for the control of each of these pests has been developed and is being put into practice by the farmers of the region.

It is a well-known fact that one of the essentials of profitable fruit growing is effective insect control. There are few, if any, areas in the United States where fruit can be grown with-

out spraying. Not many years ago, orchardists were cutting out trees because the depredations of insects had made fruit production unprofitable. Control measures were devised and have been put into practice until now no intelligent orchardist plans to produce fruit without spraying.

Economical Production Secured

Better varieties and better methods make possible more economical production. The Department of Agricultural Economics of the Kansas Agricultural Experiment Station ascertained the quantities of labor and materials required to produce wheat on each of sixty farms in Harvey County, Kansas. Twenty of these farmers secured yields of 20 bushels or more per acre and grew 100 bushels of wheat with 53 hours of man labor. Thirty-two farms had yields of 15 to 20 bushels per acre and grew 100 bushels with 63 hours of labor. Eight farms obtained yields of less than 15 bushels with 93 hours of labor. Other materials were used in similar proportions. The higher yields were due not to chance but to good farming. The farmers who secured the higher yields were the better managers and had taken advantage of more of the improvements available to them.

The effect of crop improvements is shown in the efficiency of production in 1920 as compared with 1910. The Bureau of Agricultural Economics of the U. S. Department of Agriculture computes that each farm worker is now producing 18 per cent more in crops than in 1910.

Another factor entering into increased production is the greater use of machinery on the farms of the United States. Kansas data serve to illustrate the improvement in this regard. In 1915 there were 2,493 tractors in Kansas. On March 1, 1923, there

were 24,120. Other machines that are more widely used than in earlier years include the small combined harvester and thresher, now commonly used in the hard winter wheat belt; two-row listers and cultivators; and two and three bottom plows.

Improvements in Livestock

In livestock production the same tendencies to improve production are evident. The best dairy farmers, for example, are making an effort to breed high-producing cows and feed and care for them so that they can produce economically. The first cow-testing association was formed in 1906. The number increased until on July 1, 1924, there were in the United States 627 associations made up of 16,356 herds, totalling 277,010 cows. To take a single state, the average of Wisconsin cows is 190 pounds of butterfat. Wisconsin cow-testing association cows average 273 pounds of butterfat.

Farmers are using better animals than they were a few years ago. Better stock is reaching market. Young cattle are going to market today heavier than they were twenty-five years ago. Farmers are using more protein in their feeding operations, both for cattle and hogs. This protein increases the efficiency of the ration.

In 1908 three bull associations were formed in Michigan. In 1923 there were 218 bull associations in the United States. The daughters of 70 association bulls produced 22 per cent more milk and 25 per cent more butterfat than the average of their dams.

Sales Policies

In planning the disposal of their products also, farms are using managerial ability. The small size of individual farms makes it difficult to adopt satisfactory sales policy. This situation has encouraged co-operative ac-

tion. It is true of agricultural co-operation that the failures have been more widely advertised than the successes. There are many outstanding instances of successful agricultural co-operation that receive little attention. The farmers' co-operative elevators have succeeded in improving the local marketing of grain. It is estimated that there are now more than 4,500 co-operative farmers' grain marketing associations in the United States. The co-operative livestock shipping association is another instance of the adoption of a successful sales policy by farmers. Estimates are to the effect that there are more than 4,500 livestock shipping associations in the United States. These co-operative movements are merely another evidence of the farmer's managerial ability in improving his business.

There is, of course, in farming, as in all other business, a wide variation of success. Some are failing completely, others are merely holding their own, but many others are making money. To quote from Dean F. D. Farrell, "Only a pessimist or a blind man will deny that the American farmer is rapidly becoming educated to his business."

III. THE FUTURE OF FARMERS AS MANAGERS

Farmers have made much progress through exercising their managerial ability but there is still abundant room for further improvement. In considering the possibilities of further improvements in agriculture, two basic considerations should not be forgotten: The farm is a business unit and as such is dependent upon governmental agencies for development and expansion.

Farming is an industry composed of a large number of individual enterprises. Each farm is a separate business unit managed by its operator.

Agriculture moves forward as each of these farm managers adds his improvements to the improvements effected by other farmers. The improvements that are really fundamental and lasting will be made by the individual farmer. The function of institutions disseminating information and otherwise working for the improvement of agriculture should be to provide the individual farmer with the best possible opportunities to become acquainted with, and to adopt, the latest proved improvements in production. Agriculture consists of a large number of business units with a man, a personality, back of each one. This man exercises his managerial ability to effect improvements.

The second basic consideration is that agriculture is dependent upon governmental agencies, such as agricultural experiment stations, to develop new methods and practices. The importance of research in agricultural production and marketing cannot be overemphasized. The individual farm is too small a business unit to permit the farmer to have his own research department.

As already stated, there still remains much for farmers to do in exercising managerial ability. Many farms are not organized on the most efficient basis. Simple records of the farm business will reveal ways in which this may be accomplished. The one-crop farmers of the wheat belt and of the cotton belt need more effective organization to the end that they may have more economical utilization of labor, better maintenance of soil fertility and greater dependability of income.

Furthermore, the credit utilized by many farmers is not of the best type. Often store credit is resorted to when it would be far more economical and businesslike to use bank credit. Too frequently farmers are utilizing their

credit to satisfy temporary or speculative needs. In many cases too little attention is given to long-time constructive programs, such as the development of a herd of livestock, or the adoption of a crop rotation. Much is yet to be done in adapting credit to the needs of the farmer, and the farmer has much to learn concerning the best utilization of credit.

NECESSARY FARM IMPROVEMENTS

Conservation of soil fertility, heretofore briefly mentioned, affords another opportunity for exercise of managerial ability on the part of the farmer. The fertility of the soil determines the extent of agricultural production. Many farmers are now conserving soil fertility through crop rotations, the use of manure and fertilizers, the keeping of livestock, and maintenance of the proper balance between the crops grown and the livestock kept on their farms. With the increase year by year in available information on soil fertility, these farmers will be able greatly to improve their present practices. Other farmers can make an effective start in this direction.

New varieties of crops are constantly being developed. There is still much to be done, however, in the development of crops that are resistant to disease and drought and that will give greater returns than those now in common use. The best cultural practices will be ascertained through careful investigative work.

Farms that lack livestock are losing opportunities of several kinds. As has been suggested, animals aid in conserving soil fertility. In addition, they convert unmarketable feeds into marketable forms. They employ farm labor at times when otherwise it would be idle. They reduce the cost of marketing farm crops. The Kansas State Board of Agriculture showed

this fact strikingly, when it found that the cost of shipping the feed necessary to produce a 1,000-pound steer from Hutchinson, Kansas, to Kansas City, Missouri, a distance of 235 miles, was \$27.18, whereas the cost of shipping a 1,000-pound steer the same distance was \$2.75. The cost of shipping the feed was approximately ten times the cost of shipping the steer. These characteristics of farm livestock result in increased farm income. Not only are there many farmers who could advantageously add more livestock in their farm business, but there is much that can be done in improving the quality and productiveness of livestock by better breeding, feeding and management.

NEED AND VALUE OF CO-OPERATION

Better adjustment of production to demand for farm products is essential in improving the agricultural industry. Adjusting production to demand includes producing the products desired in the quantity and quality demanded.

By co-operation farmers in many instances can improve the farming in their communities by producing uniform kinds and qualities of products. Many a community is now beginning to keep one standard breed of chickens. This makes it possible to place uniform products on the market. Such co-operation might be well extended to other phases of farm production. Communities in which both hard and soft wheat are produced often find that their wheat is discounted at the market because of the mixture resulting from threshing both hard and soft wheat with the same machine. On the positive side, the experiences of California producers are often cited to show the advantages of uniformity of quality. California oranges now reach the market uniform in size and pack of dependable quality. The work of

standardization of agricultural products, however, is for the most part in the future.

It is characteristic of the farm business that it furnishes the farmer with much of his living. There are, however, many farms on which full advantage is not taken of this opportunity. Many farms lack dairy cows, and thus the farm table is without dairy products except as they are purchased. Other farms could grow fruit, vegetables and truck crops that would add materially to their living. This would enable these farms to be more self-sufficient and would also increase their incomes, since products used for the farmer's living are income even though they do not go into market channels.

Farmers have been slow to adjust production to demand. This is, in part at least, due to lack of adequate and specific information concerning the quantity and quality of products to produce. There yet remains much to be done in furnishing farmers with usable information concerning the adjustments that are desirable in their farm organization and operation. This will involve careful studies of the relation between agriculture and other industries and between the agriculture of this country and the agriculture of the rest of the world. In addition, farmers should be informed as to the demand for their products in foreign countries and as to the possibility of getting those products into the foreign market economically and satisfactorily. With this knowledge available the individual farmer can more intelligently adjust his production to the probable demand for his products.

Still another improvement in farming as a business will result from constructive co-operation. A chief need in this field is enlightenment. The farmer must be supplied with a better

knowledge of what constitutes desirable co-operative action. Such knowledge will protect him from the well-meaning but uninformed promoter who starts one co-operative scheme after another, hoping eventually to hit upon a scheme that will materially improve the marketing of farm products

The Farm Is a Home

In considering the future progress of the farmer as manager, the fact must not be overlooked that, generally speaking, the farm business is indissolubly linked with the farm home. Only rarely does one find an exception to this situation. The farmstead, which constitutes the plant, likewise comprises the home.

The average man, in any field of work, maintains his business primarily for the purpose of having a well-ordered and happy home. He will therefore do nothing in his business which might tend to prevent the accomplishment of this purpose. In lines in which the business and the home are not closely associated, the chance of this difficulty is slight. On the farm, however, quite the opposite is true. There are business practices which would improve the farm as a commercial enterprise but seriously impair its usefulness as a home. These practices the farmer will not and should not adopt. Not only should he maintain a home of high standards, but he also should keep in mind the fact that he is training future farm managers. For, in contrast to the condition in other industries, the vast majority of farm managers were brought up on a farm, and this will continue to be the case for a long time, if not permanently.

IV. SUMMARY

To summarize: Farming, although it may and should be regarded from several other standpoints, also must

be looked upon as a business if advantage is to be taken of the opportunities which the present day offers to it. Farmers themselves so regard it. Moreover, farming is not only a business, but a highly complex business, made so by the intermingling of determining forces, certain of which are controllable while others are not.

Thus it is essential that the farmer exercise managerial capacity. He has exercised this regularly in both the organization and the operation of his farm business. The agricultural achievements that have been made would have been impossible had not the farmer exhibited efficiency as a manager. There is still, however, much room for improvement in the exercise of managerial ability, and to

this we may look forward confidently. Progress will be determined largely through the individual farmer's adopting methods that have been proved successful in scientific research or in commercial practice. In every measure designed to aid or improve agriculture, the importance of individual initiative on the part of the farmer should be thoroughly recognized; what the farmer needs and wishes is primarily an opportunity to exercise his own abilities unhandicapped. Under no circumstances, however, must success in the farm business be permitted to interfere with the opportunity of maintaining a farm home of high standard. The farmer as manager and the farmer as head of the home are not two persons, but one.

The Services of American Agricultural Colleges

By A. C. TRUE

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WITHIN the last ten years the work of the agricultural colleges in the United States has been greatly broadened and strengthened. The organization of these institutions has also been more sharply defined so as to make the major lines of work distinct as (1) research (mainly through experiment stations), (2) resident graduate and undergraduate teaching, and (3) extension work. In all these lines the work has gone beyond that which relates to agricultural production and now includes a considerable range of subjects in rural economics and sociology.

The general character of these institutions as public agencies for the promotion of agriculture and country life has also undergone considerable modification. This is shown not only by the recent Federal and state legislation affecting them financially or otherwise, but also by the closer and wider relations which they have with the Federal government, state organizations, local communities and great numbers of individuals in all parts of the several states.

There are now in the 48 states and in Alaska, Hawaii and Porto Rico, 51 land-grant institutions for white students, including 25 state universities, in which there is a division or college of agriculture, and 17 institutions for negroes in the southern states. Agriculture is also taught in a number of private colleges.

The largest and most striking development of the work of these institutions has been in the extension field under the Smith-Lever Extension Act of May 8, 1914, and related Federal and state legislation. To this work in 1923

approximately \$19,149,450 was allotted. The Federal government contributed \$5,588,000 under the Smith-Lever Act, and by direct appropriation to the Department of Agriculture \$1,284,450 for farmers' co-operative demonstration work and \$30,000 for extension work by different bureaus, making a total Federal contribution of \$7,194,450. The remaining \$11,955,000 was derived from sources within the states, including \$5,324,000 of state and college funds, \$5,743,000 provided by the counties and \$880,000 from farm organizations and other sources, mostly local.

At present out of about 2,650 counties reporting considerable agricultural products, 2,088 have men extension agents and 852 have women agents. As county agricultural agents and assistants there are 2,174 white men and 162 negroes. The county home demonstration agents number 871 white women and 107 negro women. The county men and women agents do much work with children but there are also 134 paid county leaders for boys' and girls' clubs. The state directors and the state and district leaders of the main lines of work number about 440; there are about 900 extension specialists in the different branches of agriculture and home economics with headquarters at the colleges. In all there are in the states about 4,700 workers trained in agriculture or home economics.

FEDERAL-STATE EXTENSION WORK

In active co-operation with the state and county forces is the Extension Service of the U. S. Department of Agriculture, including the Office of

Co-operative Extension Work, the Office of Exhibits, the Motion Picture Laboratory and extension specialists in the different bureaus. The Federal extension workers go from state to state to aid in the various extension enterprises and make available within the states whatever information the Department has which may be useful in such work.

Each state has an extension director, who is the joint representative of the Agricultural College and the Federal Department. Under this officer all the extension work in agriculture and home economics within the state is organized and operated. Through the extension work the agricultural colleges are brought into close touch with practically all the rural communities and are constantly giving information and instruction to multitudes of the rural people.

The Smith-Lever Act is unique in its provision for close co-operation between the Federal government and the states in a nation-wide enterprise. Under the law all the plans for the co-operative extension work are made through mutual agreements between the state colleges and the Federal Department and the funds and workers of the two agencies are mingled in the extension enterprises. The same co-operative principle is by mutual consent of the interested parties carried down into the counties and local communities whose funds are used in the work. Thus the county agent often derives his financial support from several different sources and feels that he has back of him the Federal government, the state as represented by the agricultural college, the county and voluntary organizations of its citizens. The extraordinarily complex organization of this system of popular education for farming people has been carried on during the past ten years with remark-

ably little friction, is stronger today than ever before, and has produced results of great economic and social value.

There has been an increasing participation of the farming people themselves in planning and conducting the local extension enterprises. There are now about 35,000 rural communities which have committees or project leaders who join with the extension officers annually in planning and guiding the work. Many thousands of farm men and women participate in the demonstrations of improved practices conducted on their farms or in their homes. During 1922 there were 885,000 such demonstrations and it was estimated that 3,800,000 farmers or members of their families adopted new or improved methods of farming and home making as the result of the extension work.

At first the work dealt almost entirely with the problems of agricultural production. One of the outstanding efforts of the extension forces was the stimulation of agricultural production and food conservation in the United States during the World War. Since that time the emphasis has been shifted to the economic problems of agriculture. Now the extension agents give a large share of their time to matters relating to farm management, farm accounts, cost of production records, standardizing and preparation for market of agricultural products, their marketing and the formation and management of co-operative organizations for buying and selling. In 1922 about 940,000 farmers or members of their families joined marketing organizations or were aided in the disposition of their crops or the purchase of supplies by the extension service, and this resulted in a total business of over \$260,000,000.

In a large way the extension forces

have promoted the recent mass movements of farmers seeking to improve their economic and social conditions. The farm bureaus now active in many counties had their origin in the necessity of having groups of farm people to support the work of the extension agents. Out of this grew the state and the American federations of farm bureaus. Thus was created a nationwide farm organization with hundreds of thousands of members, which is promoting a broad program of co-operative efforts in the interests of agriculture and country life. This movement aroused other farm organizations to renewed activity. A notable example of this is the Grange, which has had a remarkable revival in many parts of the country in recent years. The great organizations for marketing cotton, tobacco, grain, etc., owe much to the extension service and its supporting institutions with which they are in close touch and from which they derive much helpful information.

The farm women have had greater recognition and help from the extension service than from any other agency. In the counties and at the agricultural colleges are more than a thousand women trained in home economics who are devoting themselves to the interests of farm homes. Their work deals not only with food, diet, clothing, household equipment and management, but also with child care, health, family budgets and expenditures, recreation and social activities.

A great work for farm children has also been built up. Half a million boys and girls are annually enrolled in the extension clubs, which through their farm and home projects, prize contests, tours of observation, camps and conferences at the agricultural colleges are promoting more and better education for farm children and training them for future leadership in rural affairs.

INSTRUCTIONAL WORK

The agricultural colleges have made notable advancement in dealing with the problems of agricultural instruction in the secondary schools since the passage of the Smith-Hughes Vocational Education Act in 1917. Under this Act considerable sums of Federal and state funds are devoted in all the states to the training of teachers of agriculture. The agricultural colleges have been assigned the duty of training these teachers, though the Act does not specifically require them to do so. All the land-grant colleges have departments offering courses in general psychology, educational psychology, methods of teaching and other professional subjects and many of them have departments or courses of agricultural education. The Federal funds for vocational instruction in agriculture in secondary schools increased from \$547,027 in 1918 to \$1,759,219 in 1923 and have been more than offset by state and local funds. The Federal fund will reach its maximum in 1926, when it will aggregate \$3,021,987. In 1918 vocational agriculture was taught in 609 schools by 895 teachers to 15,453 pupils and in 1923 in 2,673 schools by 3,012 teachers to 71,298 pupils. There are 170 special agricultural schools in the United States, and there is a place for this limited number of such schools. But experience has shown that in general it is more advantageous to have the local high schools carry on the work in agriculture under the Smith-Hughes Act. The pupils, who for the most part are between 14 and 18 years of age, can then live at home and as a rule carry on the required practice work on the home farm. This also makes the school a factor in improving the agriculture of the local community.

The assumption of the duty of training teachers for the secondary schools

has affected the agricultural colleges favorably in several ways. It has greatly broadened the interest of the college authorities and teachers in the problems of agricultural education and the application of pedagogical principles to the teaching of agriculture. It has opened a new vocational outlet for a considerable number of graduates from the agricultural courses of these colleges. It has given these colleges more prominence in the thought of the pupils in many high schools and brought a considerable number of them to the colleges for long or short courses. It has fundamentally affected the relation of these colleges to the public school system of the several states and made them more fully an essential part of this system. Since the United States has only begun to develop a comprehensive system of vocational education, we may expect that with the accelerated progress which such education will make the colleges standing at the head of the agricultural division of this system will have an increasingly important part to play in its development and maintenance.

Resident teaching in the agricultural colleges has been greatly strengthened and diversified in recent years. About \$10,000,000 is now annually spent for agricultural instruction in the land-grant colleges.

In 1921 the number of instructors in agriculture in the white colleges was 2,032 men and 96 women. The total number of students of agriculture was 32,186 men and 3,183 women, of whom 751 men and 71 women were in graduate courses; 14,726 men and 487 women in four-year undergraduate courses; and 14,997 men and 1,996 women in subcollegiate work, including short courses, summer schools and correspondence courses. In the land-grant institutions for negroes there were only 847 students in agricultural courses.

The lack of secondary schools for negroes has largely prevented these institutions from doing college work and the relatively few openings for negroes trained in agriculture has turned the attention of their students to other vocations. Many more students in these institutions receive training in carpentry, tailoring, brick-laying and other trades in which skilled workers receive good wages.

In 1922 the bachelor's degree was given to 2,239 students in agricultural courses in the land-grant colleges. The economic depression of agriculture has temporarily reduced the number of students attending the agricultural courses at the colleges, as was also the case under similar conditions in former years.

The courses in the various branches of agriculture have in general become more highly specialized and technical. Emphasis is now being strongly placed on courses in rural engineering, rural economics and sociology. Special attention is being paid to better organization of the curriculum, the adoption of a group system of electives, provisions to meet the needs of individual students according to their interests and capabilities, promotion of better teaching and recognition of the importance of expert supervision of the educational work as a whole by the appointment of directors of resident teaching or similar officers. Recently there has been much interest in problems relating to the professional training of teachers of agriculture and other vocational subjects in the land-grant colleges and their association has recommended that beginning with 1925 candidates for teaching positions in these colleges be required to have had pedagogical training.

Graduate courses for investigators, teachers and experts in agricultural specialties have increased, particularly

in the stronger colleges or universities where agriculture and related subjects are taught.

In 1922, 265 students at 32 institutions received the master's degree for work in agriculture, including 44 at the Iowa State College, 39 at the University of Wisconsin, 25 at the University of Minnesota, 23 at Cornell University, and 22 at the University of California. For similar work 42 students received the doctor's degree at 8 institutions, including 16 at the University of Minnesota and 13 at the University of Wisconsin.

The public generally does not yet understand the breadth of the instructional work of the agricultural colleges and the great variety of the openings for useful service which lie before the graduates of these institutions. A considerable number of these graduates engage in general farming. Scattered throughout the states such men are often leaders of agricultural progress in their several communities. Others pursue agricultural specialties, such as breeding of improved seeds or types of livestock, orcharding, forestry, greenhouse culture of vegetables, flowers, etc. Many become administrative officers or teachers in colleges and schools, or investigators in experiment stations or the U. S. Department of Agriculture. Others hold administrative offices in Federal and state departments of agriculture or other public services. The late Secretary Wallace was a graduate in agriculture at the Iowa State College.

There are now many lines of business in which such graduates are employed. Social workers and even missionaries are being trained in our agricultural colleges. One such institution has recently made a list of more than a hundred occupations open to its graduates.

WORK OF EXPERIMENT STATIONS

The research work of the agricultural college is usually organized as an experiment station. These stations have an annual income of about \$9,500,000, including \$1,440,000 from the Federal government under the Hatch and Adams Acts. They employ over 2,000 trained workers, about half of whom do more or less teaching in the colleges. They issue annually about 1,000 publications freely distributed to nearly a million addresses. The contents of these publications are generally summarized in the agricultural press and form the basis of much of the extension work of the colleges. Many of them find their way abroad. Summaries of all of them are regularly published in the *Experiment Station Record*, and sent to libraries and agricultural institutions throughout the world.

In 1922-23 the total number of projects carried on by the experiment stations was 5,156. These dealt with a great variety of problems relating to soils, field crops, horticulture, animal husbandry, plant and animal diseases, beneficial and injurious insects, noxious animals, dairying, rural engineering, farm buildings, water supply, sanitation, foods and human nutrition, etc.

There were also 186 projects in the field of rural economics and sociology. These included studies of cost of production of staple crops, vegetables, fruits, livestock, milk, butter, etc.; farm accounts; labor; farm organization and management; co-operative organizations; land settlement and tenure; land values; marketing; rural credits; relation of industrial conditions to agricultural conditions; labor income of farmers; living costs of farm families; economic and social problems on Texas ranches; rural social surveys;

organization and curriculum of rural schools; rural primary groups; towns and villages as social and economic service stations, etc.

Increased expense of research and inadequate increase of funds in recent years have prevented the experiment stations from entering more broadly and strongly into the economic and social field. There is now pending in Congress a measure known as the Purnell Bill, the passage of which would so far increase the Federal contribution to the support of the stations that they would be able to do much more in economic and social research as related to agriculture and country life.

The experiment stations in about one third of the states, principally in the East, have more or less regulatory work. This largely deals with the analytical or other scientific work involved in the control of fertilizers, feeds, foods, seeds, dairy products, plant and animal diseases or pests. In recent years there has been a relative decrease in the extent and importance of the station participation in such work. The agricultural colleges, through their association, have supported the policy under which state departments of agriculture are being developed and strengthened as public agencies for the administration of state laws relating to agriculture. The U. S. Department of Agriculture has also favored co-operation with the state departments in such matters.

INFLUENCE OF AGRICULTURAL COLLEGES

The agricultural colleges, through their research, teaching and extension

work have attained a broad leadership in agricultural progress and their influence is increasingly felt in all parts of the United States. They have in large measure made successful farming an occupation requiring not only skill, thrift and good business ability, but also a knowledge of scientific principles and their direct and proved applications to farm operations. The value of such knowledge has been more broadly demonstrated than ever before during the recent economic depression of agriculture, due to worldwide causes over which individuals had no control. In this difficult situation there have been many farmers whose knowledge of improved practices, gained directly or indirectly from our agricultural colleges, has enabled them to weather the storm and keep their business going with a measure of success unattainable by their more ignorant neighbors. This is why the farming people have held on to the extension forces of the agricultural colleges and have led the legislatures in many states to increase the personnel and equipment of these institutions for resident teaching and experimental work. Particularly have the farmers asked the colleges to strengthen their teaching and research on subjects within the field of rural economics. Appreciating the great benefits that have come to agriculture from the work of these institutions relating to agricultural production, the farming people are hopeful that when they are strongly engaged in economic work they will be able to do much toward giving agriculture a sounder and more stable economic basis.

Crop Insurance—Its Recent Accomplishments and Its Possibilities

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ON September 9, 1922, the United States Senate passed a resolution creating a select committee of three from their number, "to investigate the subject of crop insurance." This committee was directed through the resolution to approach the subject "particularly with reference to:

- (1) The kinds and costs of insurance now obtainable;
- (2) The adequacy of the protection afforded by such insurance;
- (3) The desirability of any practical methods for extending the scope of such insurance;
- (4) The availability and sufficiency of statistics necessary to properly and safely issue additional crop insurance."

In pursuance of this resolution the committee held hearings from April 24 to April 27, 1923, at which time experts from insurance, farming and governmental interests testified. The experience thus brought together was very valuable, this being the first time that the question of insuring growing crops had been approached as a national problem. The testimony of insurance experts and others brought out especially the fact that, to be successful, crop insurance, covering our major crops, must be based upon much more detailed data than we now have and must be nation-wide in scope. The committee adjourned to reconvene in

the fall of 1923, at which time the economic condition of the farmer had become more acute. The attention of Congress, and in particular that group especially interested in the problems of our farmers, was then directed to measures of more immediate relief. The first six months of 1924 passed, including the adjournment of Congress, without any additional hearings or investigation. Then, as so often happens in the business of farming, climatic conditions changed—this time to the benefit of the American farmer. Reports have come in of a Canadian wheat crop of 200,000,000 bushels under that of last year, the United States cotton crop promises to reach 12,500,000 bales with a relatively high price, a strong export demand for grain has developed, and, together with other factors, the best year for the farmer since 1919 has resulted. This has temporarily relieved the agricultural situation, making it possible to again resume consideration of proposals designed to be of permanent benefit to agriculture. It is not out of place at this time, therefore, to bring together the events of recent years in the field of crop insurance, the problems and difficulties involved, and the success or failure attending—to consider a proposal which promises to be an improvement with both permanent and far-reaching results.

I. MR. FARMER—THE PREMIER SPECULATOR

The thought is not a new one that the American farmer as an enterpriser is subject to unusual risks entirely beyond his control. He may invest in a Florida orange grove only to find that

frost may prematurely ruin his crop; in the cotton belt the boll weevil must be reckoned with; in the central west a tornado or lightning may destroy his buildings; in western Kansas his crops

are liable to drought and pests; along river lowlands the land is subject to overflow; in many states hail is not of infrequent occurrence; and in every locality the product which he is preparing for market may have declined in price by the time it is fully produced. There are several kinds of agricultural insurance now available for the farmer, framed for the purpose of minimizing some of these risks. Thus in 1915 there were nearly 2,000 farmers' mutual fire insurance companies in the United States with a total amount of insurance in force of five and a quarter billion dollars, which was over two-fifths of the total value of all farm property in the United States at that time.¹ Hail insurance reached the high figure of \$560,000,000 written in 1919,² covering crops mostly in the north central group of states. Tornado insurance is often written as a rider in the fire policy, and is available to the farmer who feels the need of this type of protection. Livestock insurance is offered to a limited extent, covering loss of livestock due to disease or accidental death. A lightning clause in his fire policy will protect the farmer against loss from that source. The farmer may, of course, insure his family against his death or disability.

There is also, besides hail insurance which was mentioned above, a very limited amount of other kinds of insur-

ance covering the farmer's growing crops.

Such an extended list of insurance would seem to be adequate in covering the hazards of farming. Yet this is not the case. The most important risk of the farmer has for its cause the uncertainties of weather and market conditions as they affect his growing crops and has as its measure the relation which the annual gross income derived from his crops bears to his annual costs. These annual costs³ take the form of the farmer's own labor and that of his family, wages paid for hired help, depreciation of farm equipment, rental or interest charge, seed, fertilizer and other expenses. He runs the risk that his crop will not emerge in the fall of the year worth in value an amount at least equal to the aggregate of these annual costs. Many farmers run a far greater risk, *i.e.*, that their crops will not be worth enough to allow them to remain in the farming business.

This major risk of farming may be stated in another way. Suppose the yearly costs, and the corresponding annual gross income of farmer A for a series of years are as shown in table on the following page.

Column VI shows the ratio each year that the farmer's returns bear to his yearly costs. When this ratio is above 1.00 there is a net profit for the year. When it is below 1.00 there is a

¹ Year Book, U. S. Department of Agriculture, 1916, Article by V. N. Valgren on *Farmers' Mutual Fire Insurance*.

² Estimate of Hon. H. C. Wallace, Late Secretary of Agriculture, in "Hearings before a Select Committee on Investigation of Crop Insurance," U. S. Senate, p. 2.

³ I am using the term costs to include both the monetary expenses of the farmer and those items of outlay which are the result of the farmer's own work and oftentimes that of his family. These latter costs cannot accurately be expressed in terms of money. Yet they always figure in a farmer's estimate of whether his operations are profitable or not. One of the first principles of business, including that of farming, is: that over a series of years the income from the business must average greater than the costs, or effort will be directed along other lines of work. Studies of farm costs and farm income have often been made showing that the farmer is losing money every year. Such a conclusion is often in error, because too high an estimate has been placed on the farmer's own work or that of his family. The point of view has been: What *should* a farmer of his class be worth, rather than what is the least he will accept. The latter figure is the one which determines whether his income is less than his costs, and whether he will continue to farm or not.

I	II	III	IV	V	VI
	Costs	Gross Income	Loss	Gain	Ratio: $\frac{\text{Gross income}}{\text{Costs}}$
1900.....	\$1,800	\$1,700	-\$100		.94
1901.....	1,700	1,780		+\$80	1.05
1902.....	1,700	2,300		+\$500	1.35
1903.....	2,000	1,200	-800		.60
1904.....	1,600	1,600	00	00	1.00
1905.....	1,500	2,000		+\$500	1.33
1906.....	1,800	2,100		+\$300	1.17
1907.....	2,000	2,700		+\$700	1.35
1908.....	2,300	2,100	-200		.91
1909.....	2,000	2,100		+\$100	1.05
	\$18,400	\$19,580	-\$1,100	+\$2,280	

net loss. The risk of farming arises out of the fact that this ratio is not a constant from year to year but a highly fluctuating variable. Over a series of years this fraction must average at least 1.00 or the farmer will not remain in business; for any given year this fraction may be very large or very small. The greater the fluctuation from year to year, the greater the risk and the greater the need for insurance.

There are three main elements entering into this major risk of farming. The first of these is weather. This may be broken up into several parts, which will be analyzed presently in greater detail. It will be sufficient here merely to enumerate the groups to show their effect on the ratio of gross income to costs. Thus, of first importance is the amount of rainfall each year, especially in the critical period of growth, which, of course, varies for different crops. Then follow the elements of hot winds, destruction by storms, hail, frost, floods, freezing and other minor causes. These elements cause

wide variations in the quantity and quality of products grown yearly, and are hazards of great importance to every farmer.

The second main element might be called plant and animal disease, and includes damage done by insects, by small animal pests and plant diseases. In so far as these risks can be controlled they cease to be an important element. When they get beyond control a large portion of a crop may be destroyed.

The third main element entering into this major risk is that of price. In the ratio given above, the numerator, or the amount representing the value of the farmer's annual production, is the product of the quantity produced times the price per unit. Likewise the denominator—the farmer's annual costs—is made up in part, at least, of products and services times their price per unit. The prices of these products vary continually, and the extent of their variation, together with the farmer's ability to forecast their direction, measures the importance of the risk.⁴

⁴ It may be urged that the work of the farmer himself is a factor causing variations in the ratio of gross income to costs which, if true, would mean that crop insurance is a proposal to guarantee to a farmer a profit every year. This, however, is not the case. A skilled farmer may study trends in farm prices and farm production, the character of the demand for his products, preparing a suitable quality of goods for market; he may study his business from the point of view of costs, properly balancing the elements entering into the total cost of his products, and by superior methods consistently

THE MAJOR RISK OF FARMING

The uncertainty of profit or loss represented by the ratio

$$\frac{\text{Total value of crops}}{\text{Costs}} = \frac{\text{Market price of crops}}{\text{Price of labor, seed, etc.}} \times \frac{\text{Amount of crops as determined by:}}{\text{Amount of labor, seed, etc.}}$$

Weather:

Drought
Hot winds
Excess moisture
Storms
Hail
Frost
Floods
Freezing
Miscellaneous

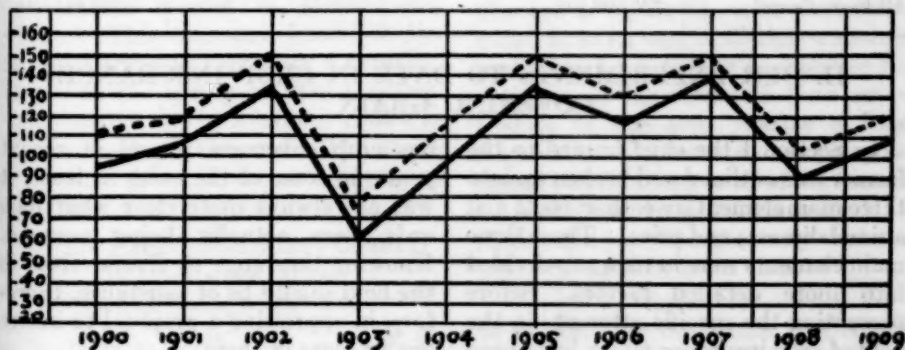
Plant and Animal Disease:

Scab
Smut
Rust
Weevil
Beetles
Gophers
Etc.

The risk involved, therefore, in growing crops divides itself into three main groups: weather; plant and animal diseases; and price variations. By the payment of a premium this risk may be shifted, in whole or in part, from the

farmer to the insurer. The farmer may have a ratio at the end of each year showing a net profit. This quality might be called his managerial ability. Or he may have a net profit each year by simply working harder than the average farmer. Obviously the opposite of this may also be true: that through a lack of managerial ability or a lack of effort a farmer may have a loss ratio, and, if continued, will ultimately be forced out of the business. But whether he is a superior or an inferior farmer, his ability neither increases nor decreases the variations in the ratio of annual return to investment. If he is above the average as a farmer, the ratio of fluctuations will from year to year range higher than the average farmer. Thus, from the illustration

above the ratio: $\frac{\text{Gross Income}}{\text{Costs}}$, when plotted for the series of years given, would be as shown by the solid line in the accompanying chart.



If this is considered the experience of an average farmer, then one with unusual ability would, while having as great a degree of fluctuations from year to year, consistently range higher than the ratio of the average farmer (dashed line). He is subject to the same climatic conditions and price variations.

It might also be thought that differences in the fertility of the soil from one locality to another might enter as a factor causing fluctuations in the ratio $\frac{\text{Gross Income}}{\text{Costs}}$ but a moment's reflection will show that the case is the same as that shown in the above chart.

shoulders of individuals to those of the group. This is the purpose of insurance on growing crops.

To date the experience in the United States in insuring growing crops is the result of two main avenues of approach. First, separate risks have been insured against, such as hail or frost; and second, a blanket crop policy covering a group or all of the risks enumerated above has, in several cases, been issued.

Working along the lines of the first method, hail insurance, through continuous adjustment and improvement during the past 40 years, has been worked out to a practical basis; within the last few years, frost insurance has become a practical line in Florida and California among the citrus fruit growers; of more recent development is rain insurance which, while not yet on a practical basis, is designed to insure the

raisin makers of California, covering loss while the grapes are being dried on trays.

A number of attempts have been made to issue a broad crop coverage some of which have met with success and some of which have not. In the following two sections the leading experiments which have been made in the United States will be reviewed, including a résumé of the more recent accomplishments in special lines of crop insurance.

That the field is a large one is shown by the following data from the U. S. Department of Agriculture Year Book, 1923, showing the insurable value of the crops for that year. For all crops the value was over eight billion dollars, and for the three important crops of corn, cotton and wheat, the value was a little over four billion dollars.

CROP SUMMARY,* 1923

Crop	Acreage	Production per Acre	Total Production	Total Value
Corn.....	104,158,000	29.3 bu.	3,054,395,000 bu.	\$2,222,013,000
Wheat.....	58,308,000	13.5 bu.	785,741,000 bu.	725,501,000
Cotton.....	37,420,000	128.8 lbs.	10,081,000 bales	1,563,347,000
All Farm Crops†.....	350,698,100			8,322,695,000

II. OUR EXPERIMENTS TO DATE IN CROP INSURANCE COVERING GRAIN

In Section I the chief hazard to the farmer was outlined and broken up into three main elements: weather; plant and animal disease; and price. These three main elements were in turn sub-divided into more detailed factors. Before presenting the specific attempts in the field of crop insurance which have been undertaken, we venture to carry the analysis of Section I a step further. The reason for this is that in the vari-

ous crop coverages placed in recent years, in some of the cases at least, it was not always quite clear what hazards were actually being covered. Knowing the range of diverse risks in the field should be of assistance, therefore, in appraising a proposal to insure one or more of them.

The point was made in Section I that all of the hazards involved in growing crops converge into an annual

*U. S. Department of Agriculture Year Book, 1923.

†Including oats, barley, rye, hay, buckwheat, tobacco, flaxseed, rice, potatoes, fruits, berries, vegetables, etc.

favorable or unfavorable ratio of gross income to costs. In this ratio both the elements of income and of costs are, throughout each season and from year to year, variables. So far there has never been an attempt on the part of an insurance company to insure the farmer against what would need to be rising farm costs. In the insurance experiments which have been based on costs, in each case the cost of each farm operation was established in advance, which changes the denominator from a variable into a constant.⁵ Nor does it seem at all feasible to insure against changing farm costs. Farm costs, when one includes the items of the farmer's own labor and that of his family, are relatively much more constant⁶ from month to month than is the item of gross income composed of the product of yield and price. Carrying the problem a step further, therefore, the major risk to be covered by insurance is represented by the fraction whose numerator is a variable income and whose denominator is a fixed group of costs.

The earliest experiment in the United States in crop insurance which the writer has found was in 1899, by a corporation located in Minneapolis, Minn.⁷ This company, known as the Realty Revenue Guaranty Company, issued in the spring of 1899 a policy, upon application by a farmer, known as an *Optional-sale Contract*. The application for this contract read in part as follows:

REALTY REVENUE GUARANTY COMPANY
of Minneapolis, Minn.
Capital Stock, \$100,000.00

I,, of P. O.,
County of, State of,
do hereby apply to the R. R. G. Company

for an optional-sale contract of \$..... per acre which is hereby referred to and made a part hereof, subject to all conditions therein contained upon all crops raised on the following described lands:

Upon this application the company issued its contract which, in addition to the provisions in the application, contained the following important points:

1. The company agreed, if the insured desired, to purchase the entire crop insured at \$5 per acre, the insured to elect to exercise the option not later than five days after threshing.
2. A premium of 25 cents per acre or 5 per cent was charged for a \$5 optional limit.
3. The farmer agreed to cultivate his crops in a husbandlike manner.
4. The farmer agreed to deliver his crop to the nearest market, if requested to do so by the company upon exercising his option.
5. The company disclaimed liability due to damage done after September 15th or after crops were harvested.

How this early enterprise in crop insurance fared is not known. If subsequent experience is of any value, however, it must not have fared very well, as the premium was entirely too low. Wheat in the fall of 1899 was selling in Chicago at about 72 cents per bushel, which at \$5 an acre would have made it profitable for a farmer to exercise his option were his crop less than seven bushels to the acre. Below a fixed limit in the contract, the company assumed loss from any or all of the sources to which the crop is exposed. It is therefore a case of a guaranty that the ratio $\left\{ \frac{\text{variable gross income}}{\text{fixed costs}} \right\}$ would

be at least 1 for the season. What the return on the crop would be would depend on the price of the grain, the con-

⁵ An exception is found, however, in the case of crop insurance on fruit; see Section III, policy of the Georgia Peach Growers' Exchange.

⁶ i.e., farm costs per acre—not farm costs per bushel.

⁷ The facts concerning this company described were brought out in a court case involving an agent of the company. See *State of North Dakota v. Hogan*, 8 North Dakota, 301.

dition of the weather, and the extent of the damage done by insect and animal pests and plant diseases.

It was not until 1917 that additional attempts were made to issue a blanket policy on growing crops. During this year two attempts were made to issue a broad policy. One of these contracts was issued by a company located in Montana. This company proposed to insure the farmer

against loss, damage or failure from hail or any cause excepting fire, floods, or failure to properly prepare the ground for seeding and properly seed, care for, harvest, protect and thresh said crop.

The policy states the number of acres insured and, to an amount of \$7 per acre, insurance to cover all of the small grain which the farmer has in cultivation. This was to prevent the farmer from insuring only the poorer parts of his farm. In case of total loss, the company agreed to pay the insured \$7 per acre for his crop. In the case of a partial loss of a crop, the liability of the company was to be computed by first determining the value of the remaining crop by multiplying the number of bushels harvested by the following values for each kind of grain: wheat, \$1.00 per bushel; flax, \$1.75 per bushel; rye, 70 cents per bushel; oats, barley and speltz, 50 cents per bushel. The resulting sum was then to be subtracted from the amount insured, and the difference was the company's liability. Thus: Farmer A has 100 acres of wheat

which he insures at \$7 per acre, making the amount of the insurance \$700. On September 10th he threshes this crop and has 400 bushels, which amount, valued at \$1 per bushel, equals \$400. The company's liability is then \$300. The other provisions of the contract on negligence, notice of loss, fraud, misrepresentation, warranty, insurable interest, and assignment were not unusual.

Which of the various elements of crop hazard did the company attempt to insure in this contract? In one respect it is very similar to the optional-sale contract described above, in that the cost feature of the farmer's risk was a constant—the amount of insurance per acre, \$7. The fact that the value of the crops was to be determined by fixed figures stated in the contract eliminates the variable element of price. The only other element left, therefore, was the amount of product, and this the company insured, in the case of wheat, at 7 bushels per acre; flax, 4 bushels per acre; rye, 10 bushels; oats, barley and speltz, 14 bushels per acre. The risks the company were exposed to included those of drought, hail, insect and animal pests, plant diseases, winterkill, hot winds, storms and other minor influences, but excluding fire, floods or the farmer's own negligence.⁸

The enterprise proved a disastrous one indeed, the liabilities of the company exceeding its assets by almost \$200,000 at the close of the season's operations.⁹ In correspondence with

⁸ In the form of a ratio the company's risk was that the fraction

$$\frac{\text{variable amount of grain} \times \text{fixed price } (\$1 \text{ for wheat})}{\text{fixed costs}}$$

would be less than 1.

As in the case of hail insurance, the effect of this kind of coverage to the farmer is: (1) that he becomes a co-insurer with the company when the market price of the grain is above the price as stated in the contract, and is insured only against a part of the direct loss due to damage by weather or plant and animal diseases; (2) when the market price and the contract price are the same, he is insured against all direct loss due to weather and plant and animal diseases; (3) when the market price is below the contract price, he is insured against all direct loss due to weather and plant and animal diseases, and a sum in addition which may be used to cover part of his loss due to the decline in market price. The following table illustrates these three circumstances:

an official of the company, the following causes of the failure were pointed out by him as the most important:

1. Poor management by the officials of the company itself.

2. The company, having a capital stock of only \$50,000, was too small for an undertaking of this kind, which should have its risks spread over a wide area.

3. Insurance was written too late in the season, with an apparent failure of the crop in sight.

The year 1917 was a year of unusual drought, which was the occasion (though not the basic cause) of the company's failure.

Another crop insurance undertaking in 1917 was by a Pennsylvania company. The policy issued by this company was practically identical to that of the Bankers' Insurance Company, the same risks being covered with a \$7 per acre limit, and the same fixed prices for the cereals insured. They charged a premium of 70 cents an acre on \$7 of insurance, or 10 per cent, and wrote most of their insurance in North Dakota.

The outcome of the season's operations was a heavy loss, though it did not result in the company's failure. Realizing that they were going to lose heavily, the company attempted, and

succeeded in many cases, to settle their losses by a return of the premium. Later it developed that the company was able to pay their losses in full, and a great number of actions were brought against the company by farmers, and several of the cases reached the North Dakota Supreme Court. In these cases there is brought out one point of particular importance: that the company wrote the bulk of the insurance at a time when crop failure seemed highly probable. Thus in one case, which reached the State Supreme Court and was decided in favor of the insured, application was received on July 12th; in another case, June 28th, and in another on June 22nd. In correspondence with a law firm which handled a large number of the cases which were brought into court, the firm emphasized the poor method of handling this insurance by the company:

The local agents for the insurance company were officers of the different local banks throughout the territory. Almost all of the farmers were indebted to these banks with the idea that the debt would be paid from the proceeds of the coming crop. Just as soon, therefore, as it became certain that drought was going to ruin the crop, the banks were faced with a situation out of which there would be no money coming to them. Immediately there was a

INSURANCE—7 Bushels per Acre at \$1 per Bu. = \$7.00

Damage to the extent that only 6 bushels per acre are harvested

Bushels harvested	Price per bushel	Loss in grain value, 1 bu. × price	Insurance received	Amt. available to meet loss due to decline in price	Percentage of loss in grain value sustained by	
					Farmer	Insurance Co.
6.....	\$2.00	\$2.00	\$1.00	0	50%	50%
6.....	1.50	1.50	1.00	0	33⅓%	66⅔%
6.....	1.00	1.00	1.00	0	0	100%
6.....	.75	.75	1.00	25¢	0	100%
6.....	.50	.50	1.00	50¢	0	100%

* Annual Report of the Insurance Department of Montana, 1917.

flood of applications for insurance, and the insurance was gladly written by the bank.

Had the insurance been written two months earlier, with a wider spread, including several states, the results would certainly not have been so disastrous.¹⁰

Probably the most extensive attempt to successfully underwrite the hazards involved in growing crops is the one begun in 1920 by the Hartford Fire Insurance Company. To date this company has made a practical test of two distinct types of broad crop coverage, neither of which were successful. They are, in addition, at the present time placing a limited amount of crop insurance on certain kinds of fruits and vegetables.

Their first crop policy, issued in the spring of 1920, was an attempt to insure to the farmer his costs of production.

¹⁰ A mutual company also wrote a small amount of crop insurance in South Dakota in 1917, but met with very little success and did not attempt to write any the following year. Another minor experiment was made in Worcester County, Mass., this same year, but their experience is of little practical importance.

In 1919 there was organized in northern Missouri a so-called crop insurance company, but in reality the policy covered damage done only by storms. Being mutual in form, the applicant for insurance became automatically a member with a membership fee of one-half of one per cent of the amount of insurance taken, the minimum fee being \$5. They were, in addition, subject to a maximum assessment of 3 per cent due on or before September 1st of each year. In 1919 they levied the maximum 3 per cent. According to the records of the Insurance Department of the state of Missouri, the company lasted only a few months, when their affairs became so involved it was necessary to place them in the hands of a receiver.

They proposed to insure the farmer against loss or damage to growing crops by hail and destructive storms, the policy contract expressly stipulating that "hail and destructive storms" mean "hail, cyclone, wind storms, and destructive rain storms when accompanied by either hail or wind, but in no event is this company to become liable for any damage done to growing crops which is caused by hot winds, drought, insects, overflow or freezing." The measure of the company's liability in case of total loss of crop was to be the value of the crop destroyed, but not more than the amount of insurance taken out; in case of partial loss the company agreed to pay "such percentage of the insurance carried . . . as is equal to the percentage of loss of crops thereon, not to exceed the net loss sustained." This type of provision regarding loss resembles the usual hail clause with the exception that the company's liability must not exceed the value of the crop destroyed. The following two ratios show the extent of the company's liability under the two conditions:

- (1) When value of crop is greater than amount of insurance:

$$\frac{\text{damage due to storms} \times \text{amount of insurance}}{\text{undamaged crop}}$$

- (2) When value of crop is less than amount of insurance:

$$\frac{\text{damage due to storms} \times \text{value of undamaged crop}}{\text{undamaged crop}}$$

¹¹ Testimony of Mr. R. M. Bissell, president of the Hartford Fire Insurance Company, before the Senate Committee investigating Crop Insurance, April 24-27, 1923.

To accomplish this there was included on the application a list of the operations and materials used in raising crops, which list the applicant filled out, indicating the expense per acre for each operation. This list included plowing, discing, harrowing, rolling, seeding, seed, harvesting, twine, shocking, stacking, threshing and rental value. A conservative figure of this total per acre was then taken, multiplied by the number of acres, and the resulting sum was the amount of insurance. On the average the company charged 6 per cent premium.¹¹

The company then insured the farmer against loss or damage to the growing crops

when caused by the elements, including frost, winterkill, flood, drought, insects or disease, but excluding loss or damage when

caused by fire, hail, wind or tornado, or failure of the seed to germinate, or failure of insured to properly prepare the ground for seeding, or to properly seed, cultivate and harvest said crops.

While this very specific clause stating the company's liability is clear, it does not adequately show the extent of the risk assumed.

What hazards of the major risk of farming were insured in this "acreage investment" policy? The assumption by the Insurance Company of the risk of the farmer's costs rising in amount was definitely eliminated, since the investment figure was estimated and fixed in advance. If costs subsequently rose or fell, the farmer and not the insurance company lost or gained thereby. Of the elements affecting the amount of the crops, all of the major hazards were assumed by the insurance company with the exception of hail. This included drought, plant diseases, insect and animal pests, and frost. Finally the very important hazard of a fluctuating market price for the crop was assumed by the company.

Expressed in ratio form the company assumed the risk that the fraction $\frac{\text{amount of product} \times \text{price}}{\text{fixed costs}}$ would be

less than 1 at the end of the crop season. Substituting figures in the ratio: if the costs figure for Farmer A proved to be \$14 per acre, then for a 100 acre field insured the amount of insurance would be \$1,400, which would be the fixed costs figure. At the time insurance was taken out with a good crop in sight, the estimated amount of the crop might be assumed to be 20 bushels per acre, or 2,000 bushels, and the estimated fall price of the grain \$1.50 per bushel. The insurance company would then start with a crop prospect of

\$3,000, which would have to decline over 50 per cent before it would be called upon to pay under their contract. But while equities may look large in the spring, they may be quickly wiped out as the season advances. Thus, in the above illustration a 50 per cent crop with a 50-cent drop in price would result in a \$400 liability, and with a premium payment of 6 per cent, or \$84.00, a loss ratio of 475 per cent.

Two other provisions in the contract should be mentioned. The first pertains to the method of determining the market value of the crop in the fall. Quoting:

It is also a condition of this policy that, unless otherwise provided by special agreement attached hereto, such actual market value shall be determined by the prevailing prices at the nearest recognized market for crop of like kind and quality at the time of harvesting, but not later than the 15th day of November following the date of this policy.

The second provision was in substance that in case of total crop loss the company's liability would cover only the amount expended by the insured in seeding and cultivating such crop up to the date of the total loss and therefore would not include items of harvesting, twine, shocking, stacking and threshing, and only a part of the item of rental value.

In testimony¹² given by the President of the Hartford Fire Insurance Company, this experiment in 1920 cost the company in round figures \$1,700,000. The company assumed a total liability of \$14,000,000, distributed with \$5,000,000 on the Pacific Coast, \$4,000,000 in the South, \$4,000,000 in the central belt, and a small amount in the eastern states. They received in premiums \$800,000, and sustained losses to the amount of \$2,500,000. The

¹² Hearings of U. S. Senate Committee investigating Crop Insurance, p. 39.

main reason for their loss in 1920 was due to the large declines in crop prices.¹³

On account of the extensive losses in 1920 on its crop investment plan, the company changed its policy contract radically in 1921, the thought being that the hazard of price fluctuation should not be borne by it. The enumerated risks covered by the 1921 policy were practically the same as those of 1920, being: "frost, winterkill, excess of moisture, flood, drought, insects or disease," but not hail. But in measuring the extent of the company's liability regarding these risks, the 1921 contract was a much more restricted one. Its provisions, outlining the limits of liability of the company in case of loss may be summarized as follows:

(1.) The amount of insurance was determined by multiplying the average number of bushels of grain grown on the land during the past five years by an average price per bushel. Thus in one policy issued, the average yield was 12 bushels per acre times 55 acres, or 660 bushels times 66½ cents per bushel, which equaled \$440 of insurance. A conservative figure was used for both the average yield and the average price.

(2) In case of total destruction of

the crop before harvest, the limit of liability of the company was not more than 75 per cent of the cost of crop operations up to that time, nor more than 75 per cent of the amount of insurance.

(3) In case of partial destruction of the crop, the company could choose between two methods of settlement: first, they could pay the difference between the market value of the crop harvested and the amount of insurance; or second, they could elect to either replace in bushels of grain the amount which by the actual yield fell below the yield as stated in the policy or they could pay the market value of this difference. In exercising this second option, the company was liable also for damage to the quality of the grain, and must either replace grain of inferior quality with grain of average quality or pay that proportion of the remaining insurance (after provision has been made for deficiency in quantity) which the damage bears to the crop harvested.

To present more clearly the nature of the coverage in this contract, the following table has been drawn up. The amount of insurance,—660 bushels times 66½ cents per bushel, or \$440,—was taken from a contract as issued. (See table on following page.)

¹³ Thus for the major crops of corn, cotton, wheat and oats, average price declines in 1920 were as follows:

No. 3 Yellow corn, Chicago, Apr.-May av. price, \$1.95; Oct.-Nov. av. price \$.84 bu.

No. 1 Northern spring wheat, Minn. Apr.-May av. price, 3.07; Aug.-Sept. av. price, 2.55 bu.

No. 3 White oats, Chicago, Apr.-May av. price, 1.05; July-Aug. av. price, .80 bu.

Middling cotton, New Orleans, Apr.-May av. price, 40.86¢ Sept.-Oct. av. price, 24.16¢ lb.

AMOUNT OF { \$440 or
INSURANCE { 660 bushels \times market price per bushel
Price per bushel used in policy = 66 $\frac{2}{3}$ cents

Size of Crop (Bu.)	Market Price of Wheat, \$1.50			Market Price of Wheat, \$1.00		
	Value of Crop	Op. Liab. I. Co.*		Value of Crop	Op. Liab. I. Co.	
		\$440— Value of Crop	Bu. Lost \times Pr. per Bushel		\$440— Value of Crop	Bu. Lost \times Pr. per Bushel
	\$	\$	\$	\$	\$	\$
1,000.....	1,500	0	0	1,000	0	0
800.....	1,200	0	0	800	0	0
600.....	990	0	0	660	0	0
600.....	900	0	90	600	0	60
500.....	750	0	250	500	0	160
400.....	600	0	390	400	40	260
300.....	450	0	440	300	140	360
100.....	150	290	440	100	340	440
50.....	75	365	440	50	390	440
0.....	0	440	440	0	440	440

Size of Crop (Bu.)	Market Price of Wheat, 66 $\frac{2}{3}$ ¢			Market Price of Wheat 50¢		
	Value of Crop	Op. Liab. I. Co.		Value of Crop	Op. Liab. I. Co.	
		\$440— Value of Crop	Bu. Lost \times Pr. per Bushel		\$440— Value of Crop	Bu. Lost \times Pr. per Bushel
	\$	\$	\$	\$	\$	\$
1,000.....	666 $\frac{2}{3}$	0	0	500	0	0
800.....	533 $\frac{1}{3}$	0	0	400	40	0
600.....	440	0	0	330	110	0
600.....	400	40	40	300	140	30
500.....	333 $\frac{1}{3}$	106 $\frac{2}{3}$	106 $\frac{2}{3}$	250	190	80
400.....	266 $\frac{2}{3}$	173 $\frac{1}{3}$	173 $\frac{1}{3}$	200	240	130
300.....	200	240	240	150	290	180
100.....	66 $\frac{2}{3}$	373 $\frac{1}{3}$	373 $\frac{1}{3}$	50	390	280
50.....	33 $\frac{1}{3}$	406 $\frac{2}{3}$	406 $\frac{2}{3}$	25	415	305
0.....	0	440	440	0	440	330

* Optional liability of insurance company.

From this table it should be evident that: As long as the market price per bushel of the grain is equal or greater than the price per bushel used in the policy, the company guarantees that the farmer will receive, in value at least, the amount of the insurance; when the market price is below the price per bushel used in the policy, the company guarantees that the farmer will have a crop of average quality of at least the amount in bushels stated in the policy or its equivalent market value. Stated in ratio form these two guarantees are:

Case I. When the market price per bu. is equal to or greater than the price per bu. used in the policy, that the fraction:

$$\frac{\text{amt. of crop}}{\text{amt. of insurance}} \times \frac{\text{market price per bu.}}{\text{price per bu.}} \text{ will equal 1.}$$

Case II. When the market price per bu. is less than the price per bu. used in the policy, that the fraction:

$$\frac{\text{amt. of crop}}{\text{Amt. bu. in policy}} \times \frac{\text{market price per bu.}}{\text{Market price per bu.}} \text{ will equal 1.}$$

The company in Case I, therefore, is exposed to the hazards enumerated in the policy which effect the size of the crop, and also the hazard of a fluctuating market price of the grain insured; in Case II it is exposed only to the haz-

ards affecting the size of the crop. The company succeeded in freeing itself from the hazards of price insurance only in part, though it is evident that by setting the amount of insurance sufficiently low the hazard of price fluctuation is small.

Only a small amount of insurance was placed under this contract by the company during the years 1921 and 1922. On that which was placed a loss was sustained,¹⁴ and in 1923 the company did not attempt to sell the policy covering the major crops. They have continued, however, to place

small amounts of crop insurance on vegetables, nursery stock, potatoes and various kinds of fruits¹⁵ with the hope that later on they will be able to successfully expand their business to include the major crops again.¹⁴

III. CROP INSURANCE ON FRUIT

In the preceding section, the main attempts of insurance covering one or more of our cereal crops were reviewed. Applied to these major crops the insurance has not thus far been placed on a workable, successful basis. However, covering certain kinds of fruit a fair degree of success has already been attained; and with a view to bringing out additional and favorable features, some of the experience in what might be

called fruit-crop insurance is here presented.

The outstanding example of attempt at general crop coverage during this year is probably that placed by the Georgia Peach Growers' Exchange with the Automobile Insurance Company of Hartford. The insurance in this case was taken out by individual members subject to conditions stipulated in a general agreement drawn up between

¹⁴ Hearings before U. S. Senate Committee on Crop Insurance, p. 57.

¹⁵ *Ibid.*, p. 41.

the insurer and the exchange. The principal coverage extends from the time the policy is issued in the spring till harvest time and includes "loss or damage by fire, lightning, cyclone, tornado, wind storm, hail, rain, flood, frost, freeze and insects." In case of loss, the Company's liability is measured by

the difference between the actual value of the crop immediately after such loss or damage has occurred, and the actual expense incurred with respect to such crop by way of cultivation, pruning, worming, fertilizing, spraying, picking, packing and shipping where such expense exceeds such value.

An additional clause limits the Company's liability to a maximum of not more than 20 cents per tree up to the time of harvest and 25 cents per tree till the time of shipment. Subject to this maximum liability clause the insurance is designed to reimburse the insured for his current expenses—his costs of operation—in the event that the sum received from his crop is insufficient to cover them. While the hazard of a declining market price of peaches is not stated as one of the hazards insured, it is clear that, in the event of a poor market *accompanied with any one or more of the enumerated hazards*, such as insect damage, the Company will be reimbursing the insured for a decline in the market price as well as the other hazards; and the temptation is, of course, in the case of a poor market for the grower to allege one or more of the enumerated causes of damage.¹⁶

The protection given under the policy is not large and the Company was able thus to charge a moderate rate of 5 per cent. Considerable use was made of the insurance during the summer as a

basis for credit advances by banks, and it is understood the insurance was, on the whole, satisfactory to both grower and insurer.

TWO CASES OF CREDIT CROP INSURANCE

Another example of crop insurance on fruit is best described by the term credit crop insurance. Two contracts illustrating this type of coverage will be presented. Both were issued, not to farmers, but to companies making advances in money or materials to farmers. Whether these advances would be met later depended on whether the farmer had a crop or not, and for that reason the company desired to insure the borrowers' crops.

One of these credit contracts was taken out by a large western concern which handles apples in the states of Colorado, Idaho, Oregon and Washington. This concern markets apples for farmers to whom it has previously in many cases, if not in all cases, made advances, so that the apple growers are indebted to the concern during a large portion of each year. The policy is intended to protect the fruit company from any losses which it might incur by reason of the failure on the part of the apple growers to meet their obligations.

The principal provisions of the contract are the following:

(1) The policy covers all loss or damage to the growing apples when caused by frost, freezing, excess of moisture, drought, hail, wind, insects or disease, but not the negligence of the farmer to properly cultivate, spray and care for the crop.

(2) The amount of insurance is the sum total of advances made by the fruit company to farmers. In making an advance to a farmer, 50 per cent of

¹⁶ Expressed in the form of a ratio the Company assumes the risk that the fraction:

$$\frac{\text{variable amt. of crop} \times \text{variable price per bu.}}{\text{costs of operation}}$$
 will be less than 1 at the end of the crop season or at any time during the growing season at which damage may occur.

the average crop in the past three normal years shall be considered to be the estimated yield, and 50 cents per box the price to be used to determine the amount. Thus a farmer with an average crop of 50 boxes to the acre could obtain a loan of \$12.50 per acre, and this would be the amount of insurance in this case granted to the fruit company.

(3) In case of damage to the extent that the box yield does not equal or exceed the box yield in the insurance contract, the insurance company may settle by either of two methods: Option (1)—They may pay the difference between the market value of the crop and the amount of the insurance; or, Option (2)—They may make up the difference between the contract yield and the actual yield at the market price of the apples.

This optional provision for settlement in case of damage is very similar to that of the 1921 contract of the Hartford Fire Insurance Company above (see page) 104, the option to be chosen depending on the market price of the apples at the time of settlement. If the market price is above 50 cents (price used in the contract) per box, which in most cases it would be, as 50 cents is a very conservative figure, then it will be more profitable for the insurance company to pay under Option (1) above. In such a case the insurance company is exposed not only to the hazards affecting the size of the crop, but also the risk of price decline. However, the yield figure is so conservative that only a very poor year would require settlement under either option. Accurate records are kept by the insured of all the advances made to farmers regarding the condition of the crop, time of advances, etc., which records are available to the insurance company. The amount of insurance, and likewise the premium, changes as the loans change, and a monthly settle-

ment is made with the insurance company accordingly.

The other credit policy is similar to the one just described, in that it is made out to a company organized to make loans to farmers, and covers the list of hazards: frost, freezing, wind, excess moisture, drought, insects and disease. It is different in two important essentials however: (1) Instead of having an optional method of settlement, the insurance company agrees that

if the entire amount received from the sale of any specific crop insured hereunder shall be less than the amount of advances made by the assured . . . then this company shall be liable for the differences between the amount actually received from the sale of such crop and the amount of insurance applying thereon.

And (2) the rate of premium charged in this latter contract depends on the limit of liability of the insurance company. This rate provision is different from any of the crop contracts already mentioned, and will be explained further.

In order to determine how much the insured should be allowed to lend to a farmer and still be covered by insurance, the insurance company states that two experienced representatives of the assured shall estimate the probable number of boxes of fruit, and on this the company will be liable up to \$1 per box. The higher the amount loaned per box, however, the higher the premium charge to the assured. Thus, suppose the estimated crop yield of oranges (this policy covered citrus fruit in Florida) were 50 boxes per acre for a given farmer, and the insured loaned at the rate of 50 cents per box. The amount of insurance would be \$25 per acre, and if the market value of the crop fell below this figure at harvest time, the insurance company would make up the difference. The rate

charged would be 5 per cent. Were the price per box .60 cents, then the loan would be \$30 per acre, and the insurance company would pay for market values below this figure. The rate charged would be 6 per cent. This graduated schedule of rates as given in the contract is as follows:

<i>Advances and/or guarantees per box</i>	<i>Rate of Premium</i>
20¢ or less	2%
21¢ to 30¢	3%
31¢ to 40¢	4%
41¢ to 50¢	5%
51¢ to 60¢	6%
61¢ to 70¢	7%
71¢ to 80¢	8%
81¢ to 90¢	9%
91¢ to \$1.00	10%

In no case shall the rate be less than 2 per cent.

This policy not only covers the hazards affecting the size of the crop, but, where the crop has been damaged by any of the causes mentioned in the contract, it covers a decline in market price also. In ratio form, the company's risk is that the fraction

$\frac{\text{size of crop} \times \text{market price}}{\text{amount of insured's loan}}$ will be less than 1. Obviously the larger the denominator is the greater the probability of the fraction being less than 1, and therefore the greater the rate should be.

Another interesting provision should be mentioned. In the event that the company pays a loss, the assured shall subrogate to the insurance company to the extent of the payment their claim on the owner of the crop, and the insurance company obligates itself, in turn, to cancel and not attempt to collect from said owner such subrogated claim. The farmer may, therefore, benefit to a limited extent because of his creditor's crop policy.

FROST INSURANCE

In 1920 a representative of some of the leading fire insurance companies of the country made an extensive study of the frost hazard in Florida. Data were gathered from all of the weather stations, from state and county sources, and from the citrus fruit growers themselves. On the basis of this material rates were determined, and during the past four years a considerable amount of frost insurance has been written. More recently the field of frost insurance has been extended to the California citrus fruit growers, to apples and certain other kinds of fruit in Georgia and California, and also covering injury by frost or freeze to the bearing tree itself.

One of the first points of interest with regard to this kind of insurance is that it is placed largely with associations of fruit growers rather than individuals. This is advantageous to the insurance company for two reasons: it affords it a more uniform class of risks, thereby limiting the possibility of only the poorer risks taking out insurance; and secondly, it centralizes its dealing with the insured into one financially responsible head. The insurance is taken out by the association and distributed among its members. In making up the total amount, it is necessary, of course, to determine for each fruit grower the amount of insurance to be applied to his farm.

To insure an orchard, an estimate is first made of the probable number of boxes the crop will harvest, the insurance being written after the fruit has set on. This estimated number of boxes is then multiplied by a conservative price per box (around 75 per cent¹⁷), which determines the amount of insurance. If later there prove to

¹⁷ Statement of Mr. J. B. Miller, General Agent, Frost and Freeze Department of several companies.

be more boxes than estimated, or less, then the amount of insurance per box is adjusted accordingly. The company then insures the farmer through his association against loss or damage by frost or freeze only while his fruit is growing and ripening, up to the time of packing for shipment.

In case of total loss on all or a part of the crop, the total amount of insurance per box is paid. In case of partial loss, the company's liability per box is such proportion of the amount of insurance per box "as the ascertained damage . . . bears to the sound value of such crop on day of loss had no loss or damage by frost or freeze occurred." It is essential that the amount payable be expressed on the per box basis, as there may be a total loss on a part of the crop and only partial on another part. It may be also that a part of the crop has already been harvested at the time of the frost, in which case a part of the crop would have no damage at all.

The nature of this risk is very similar in form to that of hail insurance, the risk of a variable price being eliminated by entering a fixed amount per box. Similarly the insured becomes a co-in-

surer with the company when the value of the crop is more than the amount of the insurance, and is in a position to profit from his insurance where the market value drops below the amount of the insurance. A loss of less than 10 per cent (in one policy 15 per cent) is borne by the insured. He is required also to keep a complete record of the harvesting, shipping and sale of his crop.

Another interesting point regarding this insurance is that the bulk of the business is distributed among a pool of several of the leading insurance companies of this country, who in turn distribute their share of the risk among a large number of smaller companies. Such an arrangement seems highly desirable in so hazardous a business as frost insurance.

What success frost insurance will meet with it is far too early to predict. It might go for many years with no loss whatsoever, and one big frost could more than offset the accumulated profits. During the 1923 season some loss was incurred in California; for the year 1924, the period of frost hazard has not yet passed.

IV. HAIL INSURANCE

The most successful line of mono-risk crop coverage is hail insurance. It has been on the market for over three decades and has, during this time, won for itself a permanent place among the many kinds of property insurance. It will not be possible here to devote the space necessary for a proper consideration of this type of coverage, hail insurance being, in view of the annual premiums received and losses paid, more important than all of the other types of crop insurance combined. Thus, on August 7th of this year, a single loss

amounting to over \$850,000 was incurred by a group of hail companies underwriting the Connecticut Valley Tobacco Association. "Hail fell unaccompanied by rain and ruined or badly damaged 5000 acres of tobacco."¹⁸ All that can be done here will be to briefly review the development of this line of insurance, its recent accomplishments, together with a few special problems connected with it.

The earliest hail insurance written in the United States was by a mutual company in 1880.¹⁹ This organization

¹⁸ From *Agricultural Co-operation*, Sept. 22, 1924, pub. by the U. S. Department of Agriculture.

¹⁹ V. N. Valgren, *Hail Insurance on Farm Crops in the United States*, U. S. Department of Agriculture, Bulletin #912, p. 2.

was formed in Connecticut by a group of tobacco growers. It was followed in 1883 by the St. Paul Fire and Marine Insurance Company, of St. Paul, Minnesota—a stock company. They began writing hail insurance in that territory after having made some study of policies issued in Germany.²⁰ By 1900, there were 37 mutuals and 1 joint-stock company; by 1905, 37 mutuals and 2 joint-stock companies; by 1910, 28 mutuals and 5 joint-stock companies. Following 1910 there was a very rapid growth, both in the number of companies and the amount of insurance premiums, so that by 1919 the premiums of the mutuals had risen to \$4,775,000, while the joint-stock companies' premiums exceeded \$19,000,000.¹⁹

The year 1919 proved to be the peak, however, in hail underwriting, the years since then having been considerably smaller. Thus from comparative statistics compiled by a leading insurance journal,²¹ premiums collected in 1923 by all joint-stock companies, leading hail mutuals, and state hail insurance funds, amounted to slightly less than two-thirds that of 1919. This decline has been due in large measure to the smaller income of the farmer and the declining value of his crops.

Another point of interest in recent years is the financial experience of the companies writing hail insurance. The bulk of the hail business is written with the joint-stock companies. With them, since 1919, each successive year has witnessed a higher ratio of losses paid to premiums received. The result has been that, during the past year, a number of the companies have discontinued writing this line. Premium rates have not been increased, however, greater care being taken in the placing of the

insurance, a deductible clause introduced designed to cut out small losses, commissions have been revised, and renewed effort made to keep the business on a profitable basis. While the effect of the rising losses is considered to be only part of a cycle which it is hoped will be followed by a few years of small losses, it emphasizes once more the importance of long and continued experience in determining probabilities of loss from the elements of weather.

With respect to the type of insurer, hail insurance differs from the other types of crop insurance already considered in that it has been undertaken not only by joint-stock companies and mutuals but also by the governments of several states. North Dakota is the pioneer, as well as the leading state in providing state hail insurance, passing its law in 1911. The operation of the law was not satisfactory for several years after its passage and in 1919 it was thoroughly revised. Other states entering the field in recent years are Montana, South Dakota, Nebraska and Oklahoma. During the year 1923, out of a total of nearly eighteen and one-half million dollars received in hail insurance premiums, joint-stock companies collected nearly twelve million, mutuals one and one-half million, and state funds a little over five million of which North Dakota's share was nearly four million.

Finally, reference should be made to the risk assumed under the standard hail policy. The usual policy contract insures against "all direct loss or damage by hail to the property described and for the term stated." Thus, suppose Farmer A is insured for \$10 per acre covering his wheat crop and a hail storm completely destroys his crop. The insurance company is liable the

²⁰ *The National Underwriter*, Feb. 17, 1921, p. 14.

²¹ *The National Underwriter*, Hail Number, March 13, 1924, p. 9.

whole \$10. Or if a hail storm destroys a prospective crop (at the time the storm occurs) of 40 bushels to the acre to the extent that the farmer gets only 10 bushels per acre, then three-fourths of the crop is destroyed, and the liability of the company to the insured is \$7.50. The company's liability in dollars in either case is clearly defined: it is that proportion of the insurance per acre which the damage done by hail bears to the undamaged crop before the hail storm occurred.²²

Whether the company, in fact, pays all direct loss in case of hail damage will

depend in each case on the relation which the amount of insurance bears to the value of the crop. In cases where the farmer takes out insurance to an amount above the prospective value of his crop at the time of loss, (which in recent years joint-stock companies have been trying to prevent), the company assumes the risk of all direct loss by hail plus an additional sum; in cases where the value of the crop is greater than the amount of insurance, the company assumes that proportion of the direct loss which the insurance carried bears to the value of the undamaged crop.

V. PRINCIPLES AND PROBLEMS

In analyzing the various policies which have been issued covering the hazards to growing crops, the point was made, in each case, that the risks to the insurance company may be expressed as a ratio in which the measure of the risk is the probability that the ratio will become less than one.²³ (For footnote see page 113.)

Knowing the ratio which expresses the risk to which a company is exposed, it would be highly desirable to know how often and the extent to which this ratio will fall below one. This is the most important difficulty in the path of a successful solution of the problem of crop insurance. In any line of insurance during the first few years there is very little data compiled in suitable form and reliable which will show the measure of risk assumed. Having no experience to which to refer to, the only

thing possible is to make an estimate from general statistics. Thus far, in the case of crop insurance covering grain, these estimates have not been sufficiently accurate to make the business profitable.

What data are needed by the insurance company in order to make a fair estimate of the degree of risk they are undertaking? If the insurance company proposes to insure the farmer only against damage affecting the size of the crop, then it needs to know, first, what is a normal crop for a period of twenty or thirty years; and second, the number of times and the extent each time that the crop yield falls below the percentage of normal against which it desires to insure the farmer. The chart on page 114 illustrates these two points, the data used being the yield per acre of spring

²² In ratio form this would be: $\frac{\text{damage by hail} \times \text{amount of insurance}}{\text{undamaged crop}}$

On the risk assumed, the standard clause reads: "In event of total destruction by hail only of the crops herein described, or any part thereof, the amount payable hereunder as to each acre where this policy covers shall be the amount per acre named herein, and in event of partial destruction by hail only of the crops, or any part thereof, described in this policy, the amount payable per acre under this policy shall be in such proportion to the amount per acre specified herein as the damaged portion of said crop or crops bears to the sound condition of the particular crop or crops so damaged."

²² Bringing, for convenience, these ratios together, they are as shown in the accompanying table:
The risk that the ratio will become less than *one*:

Optional-Sale contract		$\frac{\text{variable amt. of grain} \times \text{variable price}}{\text{amount of insurance } (\$5)}$
Montana Company		$\frac{\text{variable amt. of grain} \times \text{fixed price } (\$1 \text{ for wheat})}{\text{fixed costs } (\$7)}$
Pennsylvania Company		
Missouri Company		$\frac{\text{variable amt. of grain due to storm}}{\text{undamaged crop}}$
Hartford Fire Insurance Company	Acreage Investment	$\frac{\text{variable amt. of product} \times \text{variable price}}{\text{fixed costs}}$
	Average yield (optional)	$\left\{ \begin{array}{l} \frac{\text{variable amt. of crop} \times \text{variable price}}{\text{amount of insurance}} \\ \frac{\text{variable amt. of crop}}{\text{amt. bu. in policy}} \end{array} \right.$
Automobile Insurance Company contract covering peach crop		$\frac{\text{variable amt. of crop} \times \text{variable price}}{\text{costs of operation}}$
Credit Crop Policy		$\frac{\text{variable size of crop} \times \text{variable price}}{\text{fixed amt. of insured's loan}}$
Hail Insurance Contract		$\frac{\text{variable amount of grain due to hail}}{\text{undamaged crop}}$

There are several points in common with regard to these ratios. It will be observed:

(1) That the larger the fixed denominator is, either in amount or dollars, the greater the probability that the ratio will be less than one. Thus in one case the denominator was determined by taking a 50 per cent crop and multiplying it by a price that was considerably less than one-half the usual market price. The probability, in this case, of the ratio being less than one is very slight. In another the denominator was taken as a conservative estimate of the cost of production. The probability in that case was large.

(2) That in some cases only a part of the hazards are assumed as represented by the numerator, and in some cases all of the hazards are assumed. Thus in storm insurance, the hazard of destructive storms; in two cases all of the hazards which affect the amount of the crop are assumed; and in five cases all of the hazards which affect the amount, as well as the important hazard of a variable market price for the product, are assumed.

(3) That since the insurance company is liable when the ratio falls below *one*, it follows that the extent of their liability is one minus the fraction representing the ratio, times the amount of insurance. Thus: Company's liability = $(1 - \text{ratio}) \times \text{Amount of Insurance}$. To illustrate this in the case of the Hartford Fire Insurance Company's "Average Yield" policy, the Company's liability is optional. In one case it would be, with a \$1,000 policy, the market price of grain \$1, and an 800 bushel crop harvested: Company's liability = $\left(1 - \frac{800 \times \$1}{\$1,000}\right) \times \text{Amount of Ins.} = \200 . In the other case, with the

amount of grain stated in the policy as 1,200 bushels: Company's liability = $\left(1 - \frac{800}{1,200}\right) \times \text{Amount of Insurance} = \333.33 .

(4) That where the amount of insurance is fixed as a definite sum in the policy in advance, the contract becomes a valued policy; and where the amount of insurance shall in no event exceed the loss sustained by the insured, the policy becomes one of indemnity; *e. g.*, the Automobile Insurance Company policy.

wheat for the state of Minnesota.²⁴ Finally, it must have this information for each particular district in which it intends to place insurance. This third point is the one of greatest difficulty. There have been, for many years past, data compiled by the U. S. Department of Agriculture, in the Bureau of Crop

Estimates, showing crop yields per acre by states and for the United States as a whole. In recent years also (*i.e.*, beginning about 1915 and in some localities farther back), there have been compiled county figures showing the yield per acre. There is, in addition, the decennial U. S. Census, which gives

24

1899=13.4 bu. per A.

1900=10.5

1901=12.9

1902=13.9

1903=13.1

1904=12.8

1905=13.3

1906=10.9

1907=13.

1908=12.8

1909=16.8

1910=16.

1911=10.1

1912=15.5

1913=16.2

1914=10.5

1915=17.

1916=7.5

1917=17.5

1918=21.0

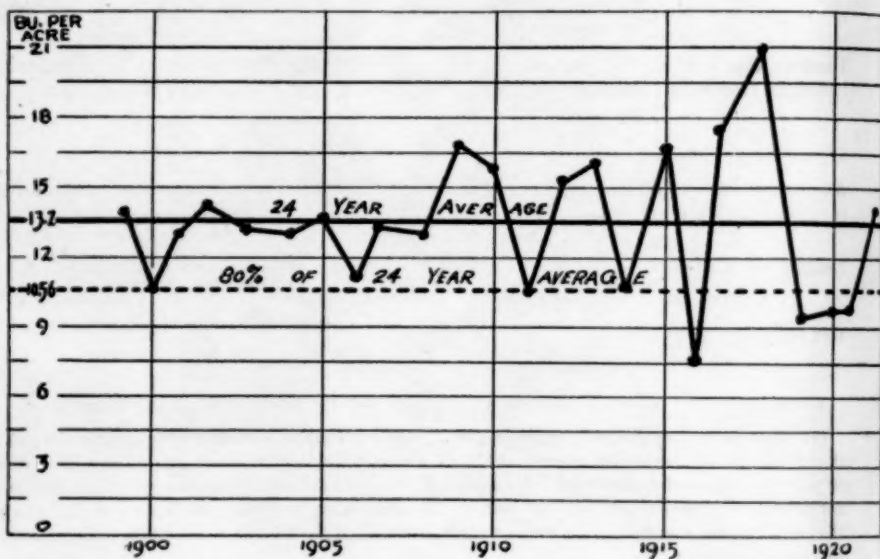
1919=9.3

1920=9.5

1921=9.5

1922=13.7

24 Yr.



Aver. = 13.2 bu. per A.

80% = 10.45 " " "

Illustration of the Data Needed to Estimate the Degree of Risk in Insuring a Farmer Against Damage Affecting the Size of His Crop

If the price per bushel, to measure the company's liability, is fixed at \$1 per bu., then the amount of insurance per acre, with 80 per cent of average yield insured, would be \$10.56 per acre; and

$$\text{Company's Liab.} = \left(1 - \frac{\text{yield} \times \$1}{\text{Amt. of Ins.}}\right) \text{Amt. of Ins.}$$

Simplifying: = Amt. of Ins. - (Yield × \$1) for those years in which the yield is less than 80 per cent.

For year 1900 = \$10.56 - \$10.50 = \$0.06

1911 = \$10.56 - \$10.10 = \$0.46

1914 = \$10.56 - \$10.50 = \$0.06

1916 = \$10.56 - \$ 7.50 = \$3.06

1919 = \$10.56 - \$ 9.30 = \$1.26

1920 = \$10.56 - \$ 9.50 = \$1.06

1921 = \$10.56 - \$ 9.50 = \$1.06

Total net liability per acre = \$7.02 for 24 yrs.

or per year 30 cents approximately. Loading 66⅔ per cent the premium charge would be 50 cents per acre on what would be called \$10.56 worth of insurance, or 4.7 per cent premium rate.

county and state figures. Individual states, in some few cases, might also furnish some material supplementing the United States figures. Thus, in recent years several states, besides making their own annual estimates, by counties, of crop yields, have passed laws requiring every three years that the assessors take a census of crops planted and harvested. All of this material is valuable for insurance purposes in giving a basis for general estimates, but is not worked up at the present time into detailed form sufficient to give assurance that individual risks can be based upon it.

Consider, for example, an individual county. It is the exception rather than the rule to find a county so uniform in kind of soil and in weather conditions that a figure giving the average yield for the county would be representative of each individual farm. It would be still less accurate to assume that the fluctuations from year to year in the yield of an individual farm would be similar to the fluctuations for the county. One cannot turn to the farmer who desires insurance to find out what his yield has been for a series of even a few years. Farmers very seldom keep records, and if asked to

EXTENT AND CAUSES OF YEARLY CROP LOSSES,* AVERAGE 1909-1921

	Deficient Moisture	Excessive Moisture	Floods	Frost or Freeze	Hail	Hot Winds	Storms
	%	%	%	%	%	%	%
Corn.....	14.6	4.	.9	2.3	.4	1.9	.7
Wheat.....	12.1	2.4	.3	3.8	1.1	2.2	.3
Oats.....	13.1	2.9	.3	.9	.8	2.2	.4
Barley.....	16.9	1.9	.2	.7	1.3	3.4	.3
Potatoes.....	13.8	3.2	.3	1.5	.1	.8	.0
	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.
Cotton.....	32.5	17.9			16.4		

	Plant Disease	Insect Pests	Animal Pests	Defective Seed	Total
	%	%	%	%	%
Corn.....	.3	2.9	.2	.6	29.3
Wheat.....	3.2	2.5	.2	.1	30.
Oats.....	2.3	1.1	.1	.2	25.4
Barley.....	2.1	1.1	.2	.1	29.4
Potatoes.....	5.2	3.4	.1	.3	30.2
	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.	lbs. per A.
Cotton.....	6.2	40.9	..	.6	118.7

* From Yearbook, U. S. Department of Agriculture, 1922, appendix giving statistics of grain crops.

estimate the yield per acre are apt to give figures from memory that cannot be depended upon.

There is another group of data available which should be mentioned. In the fall of each year since 1909 the U. S. Bureau of Crop Estimates has sent to its corps of crop reporters throughout the United States a questionnaire to be filled out, giving the causes of crop damage for the year. This form, after requiring the total loss for the year, lists the various items which might cause a loss, such as adverse weather conditions,—drought, floods, hail, frost, hot winds, etc.; plant diseases, as blight, rot, rust, scab, etc.; insect pests, as boll weevils, cut worms, green bugs, etc.; animal pests; and defective seed. The results of these figures have been made up by states and for the United States, and extend over a period, up to the present, of sixteen years. The preceding table shows the average loss in the United States, for the leading causes from 1909 to 1921, or thirteen years.

The figure of "total" in the right hand column is the percentage of a "normal" crop (*i.e.*, 13 year average) that is destroyed each year by all of the causes shown. It will be seen that with the exception of cotton, the major cause of damage was in each case drought. For cotton, insect pests (the boll weevil), was the leading cause.

This material has the same limitation as that of annual yields, *viz.*, that it applies to states or the country as a whole, rather than to individual localities. The figures are available, however, for the preparation of county totals, and in some cases separate sections of counties. Were these worked up for insurance purposes, the companies would have what might be called a key rate to start with for each county, and from this make variations to fit conditions in each locality. The figures prepared

of annual crop yields could also be compiled in still more detailed form, though not without a considerable amount of work. In the crop reporting system of the Department of Agriculture, volunteer and paid representatives give figures for each individual locality, the reports being most numerous in agricultural areas of greatest importance. By arranging these individual annual reports in a series, it would be possible in many cases to work out fairly accurate "normals" and deviations from year to year from the normal.

Were the data compiled in suitable form, so that a rough estimate of the hazards involved could be made, it still remains a problem what form the insurance is going to take. What would the farmer like to have insured and be willing to pay for? What can the company successfully insure? There are at least two purposes for which the farmer would like to have crop insurance. One is as a basis of credit upon which he may borrow at his local bank. The insurance in this case would not need to cover more than 50 per cent of the estimated fall value of the crop. The rate, however, must not be so high that the premium, together with the discount charged by his bank, will become an unduly heavy burden.

The second purpose for which the farmer would like insurance is to cover his costs of production. Two points at once suggest themselves; how much is the farmer willing to pay for this protection; and second, what are his costs of production? There is no practical value in preparing an insurance contract which the farmer will not buy, and of first importance in this respect is the rate charged. From the experience which the companies have had in writing hail insurance, it is reasonable to assume that the tier of states from North Dakota to Texas would be willing to pay between 10 per cent and 15 per

cent, and the states east of this group 5 per cent or 6 per cent. With this rate to be charged, could the farmer's costs of production be insured? The answer to this question depends entirely on what the farmer would like to have included in his costs. If they are to include what might be called prime costs; *i.e.*, seed, plowing, disking, or an amount sufficient to start the farmer again in case of total loss, the insurance may be written within the limits of a reasonable rate; if they are to include all of the farmer's costs, including estimates of his own labor and that of his family, it is not only impractical, because of the rate that would have to be charged, but also impossible, because of the indefinite and variable character of the costs, to write such kind of insurance.

There have been many excellent studies of farm costs, both over a wide area for a particular year and for a concentrated area over a series of years. A conclusion often reached is that, entering the farmer's own labor at a very conservative figure, he is consistently losing money. Another well-known fact is that from farm to farm costs vary widely. In the "acreage investment" policy issued by the Hartford Fire Insurance Company, these variations in farm costs (or what farmers thought was their farm costs) constituted one of the first difficulties they encountered. All that could be done was to take a conservative estimate of the farm costs and let that be, for insurance purposes, the investment. When this is done, however, unless by the merest coincidence the estimate and the actual costs are the same, investment crop insurance ceases to be such, and becomes simply insurance up to a certain amount per acre. It might be a good selling point to call the insurance "investment insurance" and point out to the insured that the amount

he is insured for covers his main costs. But in that sense any crop policy which pays a benefit might be called "investment insurance," since the benefit will meet a part of the costs.

There has been considerable discussion, among those most vitally interested in working out crop insurance to a practical basis, as to whether it should or should not insure costs of production. The answer to this would seem to be—if total costs, no; if partial costs, yes. But the real question involved is not one of costs of production insurance or not, but, how much per acre is the insurance to be? Suppose, for example, that in a given case total estimated costs could be accurately determined and were found to be \$14 per acre, and that the important prime costs of seed, plowing, disking, drilling and rolling were found to be \$4 per acre. Between these two limits there is a range of \$10, and the important question is, within these limits, just how much per acre shall this farmer be insured for? If his insurance is to serve as a basis for credit, or to avoid what might be called the catastrophe hazard (*i.e.*, a crop loss of say 75 per cent or more), he need be covered to an amount of perhaps not more than \$5 or \$6 per acre, and the rate will be relatively low; if his insurance is to cover the major part of his costs of production, say up to \$10 per acre, the rate will need to be higher, since the probability of loss is greater.

In this connection the second credit crop policy cited above offers an additional suggestion. The policy in that case was taken out by a company financing fruit growers, and the amount which they loaned to a farmer was the amount for which they were insured. If this amount was large the rate was high, and if it was low the rate was low. (See schedule, p. 109). Carrying this graded-rate plan over to insurance on

the major crops, a similar schedule might be worked out there. The agent, in soliciting the farmer's insurance, might then offer him a policy which, in the event of total crop failure, or such a failure that it is unprofitable to harvest the crop, would pay him \$5 per acre and at a rate of say 3 per cent; or he could offer \$8 per acre insurance at 6 per cent; or \$12 at 10 per cent. This plan would have this advantage, that in case a farmer wanted insurance, in which the probability of the insurance company having to pay was relatively high, it would be perfectly clear to him that he was paying an extra premium for it.

By properly grading the schedule of rates, also, incentive to the farmer to take out a small amount per acre instead of large amount would result. This would enable the insurance company to get a wide spread of risk and require loss payments less often than with the higher limits. It would also enable them to accumulate individual crop records. In time it should result in the farmer viewing his policy as a means of protection against unusual damage, and not, as at present in many cases, a source of profit. And with respect to hail insurance at least, the farmer is not to be blamed for his present attitude either. When fire protection is effected at considerably less than 1 per cent, and he is paying from 6 per cent to 12 per cent for his hail insurance, it is quite natural that he should hope for some return on his outlay.

A problem of equal difficulty to that of determining the amount of insurance, is what hazards shall be covered. Referring to the ratios given in the preceding sections, it will be seen that in some cases only the hazards affecting the amount of the crop are assumed, while in others both the risk of a variable amount and the risk of a variable price are covered. From the farmer's

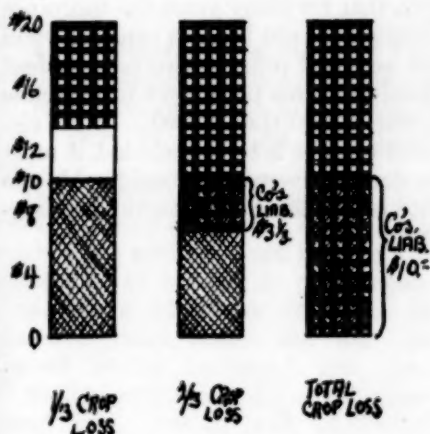
point of view, the latter hazard is of equal or perhaps greater importance than the former. From the company's point of view, it is a question of being able to cover this additional hazard and still keep the premium within reasonable limits. It should be observed here that in practice the farmer has been insured against a declining market price only on condition that his crop was damaged by weather or plant and animal diseases.

There are two methods by which these hazards may be assumed, whether one or both. Suppose the company desires to cover only the hazards affecting the amount of the crop. In this case a fixed price per bushel would have to be assumed as the price at which a loss will be measured. Then the company can either agree to pay for all loss in crop yield below a fixed limit at the assumed price, or it may agree to meet any loss (usually above 5 per cent or 10 per cent) which the insured may have in such proportion of the amount of insurance as the damage bears to the undamaged crop. The two cases are illustrated in the accompanying chart. Here three examples are assumed: a one-third crop loss, a two-thirds crop loss, and a total crop loss. The liability of the company is shown in each case. In the event of total loss both plans pay the same; but where a partial loss only occurs, in Case II the company is called upon to pay in part (unless the loss is slight) each time; while in Case I, unless the amount of insurance is equal to the full estimated value of the crop, the company will be called upon to pay only after considerable loss has resulted. In the illustration shown, one-half of the crop would have to be destroyed before the company's liability would begin. The Montana crop contract reviewed above illustrates Case I, while the usual hail contract illustrates Case II. As applied to a

CHART ILLUSTRATING TWO METHODS OF INSURING CROPS

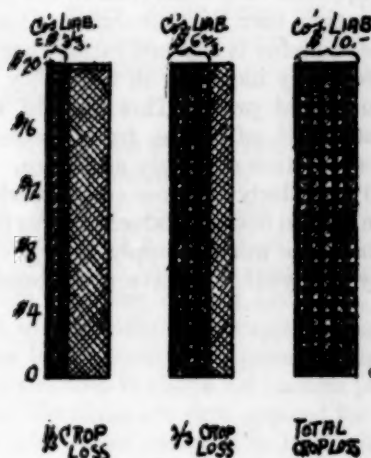
- TOTAL COLUMN = VALUE OF UNDAMAGED CROP.
 ■ CROSS CHECK = AMOUNT OF INSURANCE.
 ▨ DARS = AMOUNT OF DAMAGE.
 ■ CHECKS AND DARS OVERLAPING = LIABILITY OF COMPANY.

CASE I



AMT. OF INSURANCE { 15 bu. crop
 at 66 2/3¢ per bu = \$10.00 per A.

CASE II.



UNDAMAGED CROP = 30 BU. per A.

crop policy, plan I would seem to be better suited in this respect; namely, that under a crop policy covering a large number of hazards the insured is very apt every year to have a loss from one or more causes, and in such event, under plan I, the loss would have to be large enough to bring the value of the crop down to the amount of insurance before it would be considered; under plan II each separate loss would need to be adjusted.

The insurance company's liability in Case I above, when it does not assume the hazard of price fluctuations, is:

$$\begin{aligned}
 \text{Company's liability} &= \frac{(1 - \text{variable amt. of crop} \times \text{fixed price})}{\text{amount of insurance}} \times \text{amt. of insurance.}
 \end{aligned}$$

or simplifying:

$$\begin{aligned}
 \text{Company's liability} &= \text{Amt. of Insurance} - (\text{variable amt. of crop} \times \text{fixed price});
 \end{aligned}$$

and with the hazard of a variable market price assumed it would be:

$$\begin{aligned}
 \text{Company's liability} &= \text{Amt. of Insurance} - (\text{variable amt. of crop} \times \text{variable market price}).
 \end{aligned}$$

This point should be observed: that if the company assumes the risk of a vari-

able market price, while the difficulty of measuring the risk assumed is thereby increased, the actual probability of loss is not necessarily increased, and for certain crops may be decreased. That is to say, for any given year an unusually small crop may result, but the price per bushel that year may be high and thus offset the low yield; and if year after year there are more instances in which yield and price move in opposite directions than in the same direction, then the probability of loss to the company is lessened rather than increased by including in the policy the element of price. This thought suggests itself, of course, from the reciprocal relation of supply and price.

Particularly in those crops in which the United States produces a large fraction of the world's supply, a large crop any one year will have a correspond-

ingly low price, or a small crop, a high price. But this would only be true provided the increase or decrease in supply was due to a *per acre increase or decrease*, and not one due to variations in the yearly amount of land planted to the crop. It would then be true for insurance purposes, provided the company placed insurance over a wide area and to such an amount that the average yield on the crops they insured was approximately the same as that of the United States as a whole. It is probable that for many years the insurance company would have to consider yield per acre and price as two independent risks, and thus be subject to a decline in one or the other or both. If the element of price is to be included, it must be done by increasing considerably the rate or reducing the amount of insurance.

The Agricultural Situation as Viewed by a Western Senator

By HON. ARTHUR CAPPER
United States Senator

IN the valley of travail which agriculture has traveled in the last four years, and from which it is now beginning to emerge, farmers have had time to do some real thinking. At first we "saw through a glass darkly," but the economic outlook has grown plainer with the years. As a result of this solid and intelligent consideration given to rural problems, the future should take care of itself in a happier way.

The overproduction debacle has been a nightmare. And it has been made more acute in most lines by the operations of farmers in other countries. Take wheat for example. In the five years before the war the United States harvested less than 50 million acres annually of the great bread crop. But in 1919, 75,694,000 acres were cut. Of course the acreage was then reduced slowly, to 57,111,000 acres for 1924, but it could not be brought down fast enough to avoid a slump in prices which drove tens of thousands of producers into bankruptcy. Meanwhile Canada increased its wheat production in the postwar years, as compared to the prewar, 129 per cent! Australia contributed 32 per cent, and Argentina 6 per cent.

And all that at a time when European markets were suffering from a diminished buying power, because of the poverty of the people there!

This is just an example of what occurred in other lines of farm production.

It is perfectly evident, then, that greater care must be given to try to

balance consumption with production. Which is easy to say. But doing it with crops is something else again.

Weather, insects, diseases and a hundred other items enter into the calculation: these are things which a shoe manufacturer, for example, need not consider.

ADJUSTING PRODUCTION TO CONSUMPTION

As another item, let's consider potatoes. And at a risk of bringing back to memory some unhappy history, we will take the crop of 1922 with a yield of 4.1 bushels per capita. Now it has been shown by experience that when the crop is above 3.6 bushels per capita the skids are thus greased for a fine slide. This occurred in 1922 with some extra emphasis. Many thousands of winter potatoes were not even dug.

I know there was some increase in the potato acreage that year, but the main trouble came from favorable growing weather, a considerable freedom from disease and insect injury, and the resulting high yields.

And, of course, it is all wrong that a big crop should bring far less money to growers than a small yield. But on an average we are confronted with the hardboiled fact that it does. Now so far as the long range trend goes there is a faint prospect of a little relief from that, maybe, by the development of various kinds of storage facilities. Potatoes supply an excellent example: it is true that dehydrating is making some progress in this field,

which is a mighty fine thing. But it is a slow development.

In the meantime the grocery bills of farmers must be paid.

And so I say that despite the extreme difficulty of adjusting production to consumption it is a problem of major importance, which should have all of the thought and study we can bring to bear on it. Obviously we need all the information we can get on probable acreages and yields. All agencies, such as the agricultural colleges, county agents and farm papers should help in bringing this to the attention of farmers. It also is evident that organized agriculture has an increasingly important place to fill in this field.

But after the food is grown then comes the problem of selling it to the best advantage. And here we find that conditions are changing rapidly.

Especially is the long range trend of the foreign demand for American food on the decline—and I say this with a full knowledge of the interest European buyers have been showing these last few months in the wheat crop of 1924. Unless there is another great war, or some other world calamity, I do not expect to see American farmers selling much food to Europe 10 years from now.

CITY NEEDS AND MARKET EXPANSION

But in the meanwhile we find an amazing expansion in the home market—for which we should give many thanks. The population of America is growing steadily, perhaps as much as one and one half million persons a year, largely in the cities. These great centers of life are fairly prosperous, and in my judgment they will continue to be. Personally I have a tremendous belief in the future of the industrial life of America—I think the

growth of manufacturing in the United States is one of the marvels of the age. Anyhow the income of city workers is 99 per cent higher than it was ten years ago, and the cost of living is but 71 per cent more—their wages will buy 36 per cent more food than in 1913.

This is of extreme importance to farmers because of the old axiom that when city workers have money they will spend enough of it to buy an ample supply of food of good quality.

So we find that the growth of the cities has been, and will continue to be, an item of vast economic importance to farmers. The relatively declining proportion of agricultural population may constitute, as many students believe, an element of political danger. But this is something that the years will show.

In the home market there is hope. It is among our own folks, whom we can afford to study, so we can please them.

This effort to "register" on exactly what the cities want in the way of food will be aided by the growth in co-operative marketing. I know mistakes have been made in this field. But I would like to have someone point out to me a line of American business in which the managers have not made errors! Through it all this united effort in selling has gone ahead steadily, handling a larger proportion of the products of the farms every year. It will continue to grow.

CO-OPERATION OF CONGRESS

I am glad Congress has been able to help in the growth of the new agriculture. Certainly a farmer can now co-operate with his neighbor across the road without running a risk of going to jail. We have made substantial progress with the land banks and with rural credits in general. I

presume Congress will continue to keep closely in touch with the needs of agriculture, and to handle legislation in a way which will please the producers. At least I am convinced that it would be the part of political wisdom for the members to do this. In national legislation the intelligent, well-read farmers of today want sound action, and not hot air from speakers at the pre-election picnics.

Briefly, American agriculture needs well-balanced production, of quality products, sold in the most economical way, which includes a larger place for co-operative marketing. It must have from time to time, the benefit of sound legislation by Congress. Please let me say, in that connection, that as a business man I do not want Congress

to "horn in" to business any more than is necessary. But—and a bushel of butts! In this modern and complex organization of our economic and social life we cannot let the great marketing centers for livestock and grain, for examples, go "hog wild" with no rules of the game, despite the fact that this might have been safe a generation ago. Laws must be based on the life of today—on conditions now, not those of the past.

So far as the future of agriculture goes, I'm an optimist. I think we are through the main force of the typhoon which all but engulfed agriculture. But for a little while yet the going will not be easy, and we must keep a "weather eye" constantly on the southwest horizon.

A National Agricultural Program¹

By HENRY C. WALLACE

Late Secretary of Agriculture of the United States

DURING the war when the need was for greatly increased agricultural production the national program was in fact a farm management problem. The urge was to produce without limit and at whatever cost, and the problem was how best to direct the farm operations to bring the result desired. During the war we were filled with patriotic fervor. The slogan was "Win the war—damn the expense" and we did things ourselves and urged others to do things which we would not have done under other circumstances. We had a national agricultural program, but it included only increased production and the means to that end, without regard to cost or consequences then or in the future. Because of that farmers generally have had a hard time of it since the war. Almost everybody assented to the program at that time, but it is unfortunate that the success with which it was carried out has made us so much trouble.

Now the need is not for greater production, but for a better adjusted production and to some extent for a reduced production. That is a very different matter and much more difficult. The plowing up of meadows and pastures and seeding to grain is quickly done. Getting the grain fields back into grass is not so easy. During the war there was a good market for everything produced. Now market demand is uncertain with little assurance of more certainty in the future. During

the war prices were reasonably good and all could join in urging large production. Now men who value their reputations as wise counselors hesitate to advise.

To suggest that the national agricultural program for 1924, or for any other period except in time of national emergency, is solely a problem of farm management is almost to say that there is no national program. Good farm management is necessary to the successful carrying out of any program, but it is not a program except as it applies to the individual farm. In times such as these the problems of farm management on most farms are reduced to the simplest terms and can be stated very briefly. For example: produce as much as you can and as cheaply as you can of what you can produce best; spend as little as you can; do without everything you can; work as hard as you can; make your wife and children work as hard as they can. Having done this, take what comfort you can in the thought that if you succeed in doing what you set out to do, and if most other farmers also succeed, you will have produced larger crops than can be sold at a profit and you will still be under the harrow. Nevertheless, the average farmer is forced by unhappy circumstance to adopt exactly that policy. It is not good for the farmer, not good for the farmer's wife and children, not good for the nation.

There are those, perhaps, alas, even among economists, who lean to the view that it is by following such a program as I have outlined that the farmer must work out his salvation. They say that during the depression of

¹ From the *Journal of Farm Economics* (January, 1924, Vol. VI, No. 1) with the special permission of H. A. Wallace, of *Wallaces' Farmer*, Iowa, son of the late Secretary Wallace. This article is reprinted in memory of, and as a tribute to, the splendid work done by Secretary Wallace.

the last three years the farmer found himself exactly where he ought to have known he would find himself. That such periods always follow wars, and that the farmer should have known that and set his house in order. That those farmers whose foresight was not as good as their hindsight must take the consequences, work hard, keep cheerful, and if they survive take comfort in the thought that the next time they will know in advance what is going to happen to them. Those who take this view will interpret my subject as meaning that the only workable national agricultural program is the satisfactory solution of the problems of farm management on the individual farm by the individual farmer in the light of such helpful information as he can get.

What is meant when we speak of a national agricultural program? Is it a program which most farmers are compelled to adopt by brutal force of economic laws and which therefore becomes national without effort or desire? Or is it a program carefully developed after taking due note of conditions, their causes and effects, and having in mind, first, the restoration of agriculture to a fairly prosperous condition, and, second, the maintenance of agriculture as the basis of our national life, and the farm home as the institution in which more than one-third of our young people are born and trained for citizenship? If we mean the latter then a national agricultural program must necessarily include more than the satisfactory solution of the problems of farm management.

If we should undertake to suggest a national agricultural program for the years 1924-25, it would include at least the following subjects as requiring attention:

First, good farming with all that those words imply; the use of good seed,

good cultural methods, good livestock, good care and feeding, economy of operation, and everything else that goes with really good farming.

Second, which is really included in the first, good farm management; wise selection of the crops to be grown, and of the livestock; adaptation to soil and climate; the best adjustment of acreage to conditions both on the farm and off; proper fitting of crops for market; and everything which ought to go with good farm management.

Third, making available to the farmer through Federal and state agencies information which he cannot secure for himself but which he needs to enable him to produce efficiently and intelligently and to market to the best advantage. For example, knowledge concerning the control of plant and animal diseases and insect pests, conditions at home and abroad which may influence demand for and prices of crops grown, such as probable production at home and in competing countries, business conditions, trade arrangements; in short, exactly the same kind of information the business man wants to know concerning probable markets for his products.

Fourth, how best to speed up the dissemination of knowledge concerning the new credit facilities provided by the Federal Government, not for the purpose of encouraging the farmer to go deeper in debt but to help him get out by securing lower interest rates for what he must borrow and by refunding his short term obligations for longer periods through which he may have a fair chance to work out.

Fifth, such reduction in freight rates as may be possible and still maintain good transportation service.

Sixth, how the government might effectively help the farmer bridge over this period of stress, which would include consideration of the various sug-

gestions for disposition of surplus over and above domestic requirements in such a way as to bring up the domestic price to more nearly its normal purchasing value.

Many other subjects might properly be included in the consideration of a two-year national agricultural program, but the foregoing are perhaps of most pressing importance, and with the exception of the last two will probably be included by common consent. Discussion of such a program would immediately center around any suggestion of government activity. One group for two years past has insistently demanded government action to the extent of fixing arbitrary prices upon important farm commodities. Another group has denounced such proposals as highly immoral and suggestive of paternalism and class legislation in the worst form. A third group recognizes the need of more equitable prices for farm production and concedes the propriety of government action, but wishes to be assured that any action taken will do more good than harm. This latter group sees the folly of arbitrary price-fixing but is disposed to favor any arrangement which might accomplish the same purpose without making worse a condition which is already bad enough.

It will be conceded, especially in a group of economists, that the unrestricted operation of economic laws in course of time will bring about better material conditions for those who farm. These laws are at work. They are driving people from the farms and will continue to do so until farm production is reduced to a point where the demand for food will compel a fair price. They are transferring the land from those who farm it to those who do not, increasing the number of non-resident land owners and the attending evils. They are compelling those farmers who

manage to hold on to follow methods of farming which deplete the fertility of the soil and permit their buildings, fences, and the productive plant to deteriorate at a rapid rate, thus using up capital investment. They are reducing the standard of living in the farm home, compelling hard labor by the farm mother, depriving the farm children of their rightful educational and social opportunities and creating in them a hatred of farm life which will lead them to leave the farm at the first opportunity. The free operation of economic laws is working all of these evils, and more.

If there had been no interference by the government with economic laws as they might affect the farmer during the war period; if there had been no arrest by the government of economic laws as they affect other groups, the industrial group, the transportation group, the labor group; then the case for the farmer could not be presented with such assurance. There was such interference. The farmer was deprived of many of the benefits which would have accrued to him from the free operation of economic laws during the war. Other groups have been protected by the government from the full sweep of economic laws. Once such a policy is adopted for the benefit of one group it must be applied fairly to all or we enter a period of economic and political disturbance, the result of which we can not foresee.

Confronted with national problems, agricultural, economic and political, of greater magnitude than ever before encountered, would that more economists might attune their ears to the Macedonian cry that comes up from the open country, give up for a time their detached seats of observation from which they view domestic and world activities with cold gray eyes and make records which may enable future

economists to explain what happened, and why it happened, and take an active interest in those who struggle with the definite purpose of helping them work out their problems, not alone for their benefit but for the benefit of the nation.

A national agricultural program worthy of the name must include consideration both of what it is practical to do and what ought to be done to help agriculture bridge over the present depression, and what must be done to build a stable and thoroughly sound agriculture for the future.

We have come to the turn of the tide in our agriculture. The easily tillable land has been occupied. For a considerable time at least the farmer must look for his financial reward not in the increased value of his land upon which he can realize either by sale or lease, but by average annual profits from productive work. Before many years our consuming population will use as much as we now produce, and from that time on the problem will be to increase food production on a basis which will feed our people at a reasonable price and give the producer a fair return on his capital and a fair wage for his labor.

Any large increase in production must come from land already under cultivation. There are considerable areas of new land which can be brought under the plough, such as dry lands subject to irrigation, wet lands subject to drainage, and cutover lands from which the stumps may be cleared, but the reclamation of such lands cannot be considered until prices of farm products can be depended upon to yield fair returns on the capital and labor invested.

A national agricultural program looking toward the future therefore must include:

The strengthening of scientific re-

search in the fields of production, utilization and marketing.

The direction of land settlement with the view to wise use by the farmer rather than with a view to profitable exploitation by the promoter.

The survey of our land resources with the purpose of encouraging most efficient utilization.

The direction of reclamation as the demand for food justifies the bringing in of additional areas, having in mind the needs of the community or region, as well as of the country as a whole. Reclamation policies should grow out of public needs and agricultural possibilities and not out of the dreams of engineers or the ambitions of empire builders who wish to "develop the country" usually for the benefit of their own pocketbooks and at the expense of the hungry home seeker.

A consideration of the subject of land tenure with full recognition of the fact that as land increases in value an increasing percentage of it will be farmed by tenants, because they can better afford to pay rent at a very low rate on land value than to burden themselves with the load of debt which would be necessary to undertake to purchase. The tenant system is inevitable and public interest should be directed not toward a hopeless effort to do away with it, but toward an effort to set up a land lease to which the parties will be not only the landlord and the tenant but the land itself.

The development of methods of crop insurance by which hazards over which the farmer has no control, such as weather, may be distributed over large farm groups instead of being carried as now by the individual.

The development of a more efficient and economic system of marketing, which would necessarily include the grading and standardization of crops on the farm and the direction, in so far as

possible, of co-operative marketing efforts along sound business channels.

The consideration of transportation costs as they influence both production and the cost of marketing, and the reduction of such costs by readjustments in the production program or by shifting industries.

The study of transportation systems and methods with the hope of improving and extending them by greater use of highway and water routes.

These and other subjects of perhaps lesser importance must be considered in undertaking to prepare a national agri-

cultural program. It is assumed that it is or will be the national purpose that the nation shall be self-sustaining agriculturally and that what needs to be done will be done to accomplish this purpose.

If such should not be determined to be the national purpose, then instead of a national agricultural program we shall have a class or group program, in the working out of which there will be class and group warfare, economic and political, with resulting evils from which we may earnestly pray to be delivered.

The Farmer's Foreign Market

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THE United States at one time was the leading exporter of agricultural products in the world, but long before the disturbances of war threw unusual burdens of production on the American farmer, other agricultural nations were taking our place in the foreign market. Leading thinkers predicted that the time was soon coming when America would cease to export a surplus of farm products. The remarkable power of our agriculture to expand with war-time demands tended to discredit this theory, but the recent reappearance in our own country of an excess of imports of food over exports in terms of value and the development for the first time of an actual net import in value of all agricultural products gives occasion for careful deliberation. At the same time our farmers who have a surplus of certain farm products for export are seriously disturbed over the appearance on the world's markets of an abundance of similar products sold by other countries at prices below our own costs of production.

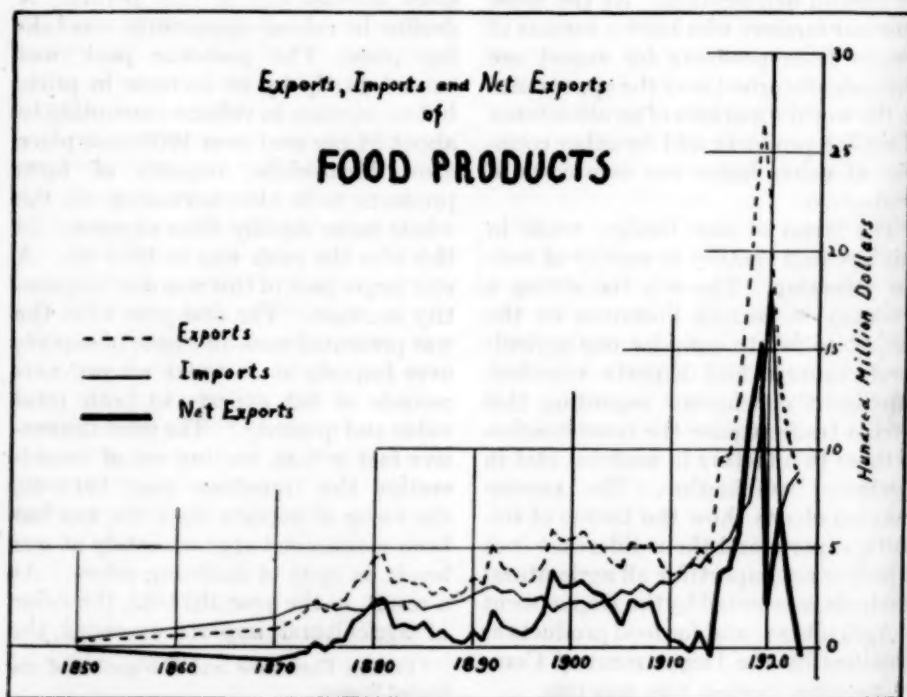
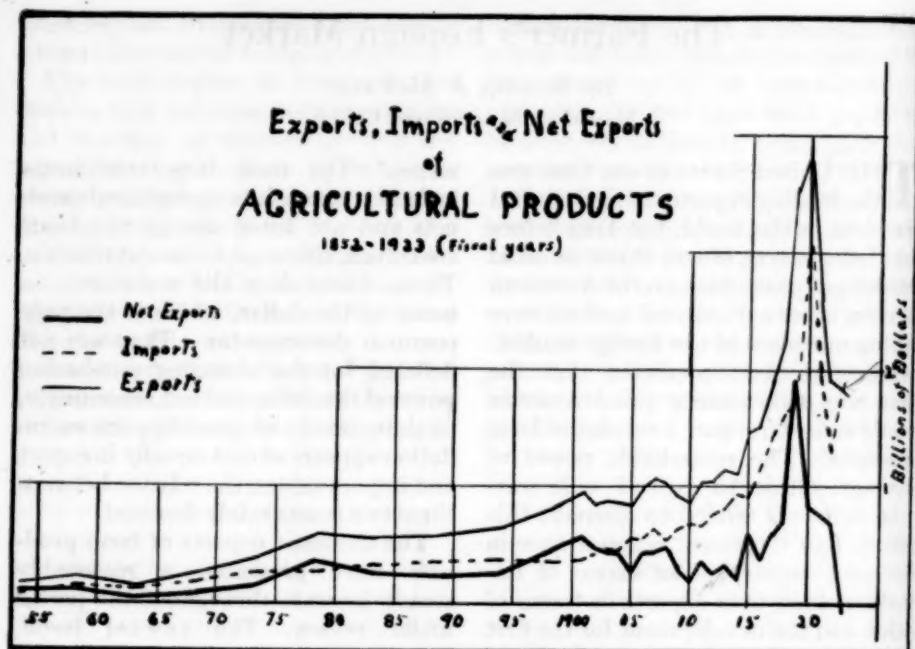
The trend of our foreign trade in this last half century is worthy of serious attention. There is too strong a tendency in current literature on the subject to fail to consider our agricultural imports and exports together. Intelligent conclusions regarding this foreign trade require the consideration of these two factors in contrast and in algebraic combination. The accompanying charts show the trends of imports, exports and their difference (net export or net import) for all agricultural products, as selected by the Department of Agriculture,¹ and for food products as classified by the Department of Com-

merce.² The most important items included among the agricultural products and not listed among the foods are cotton, silk, wool, hides and tobacco. These charts show the movements in terms of the dollar, which is the only common denominator. They are not deflated for the changing purchasing power of the dollar and fail, accordingly, to show trends of quantity. Since inflation appears almost equally in export and import values, the relation between these two is accurately depicted.

The domestic exports of farm products have presented a reasonably steady increase throughout the period under review. The upward trend, however, in the first decade and a half of the century was not as great as the price increase during that period. A decline in volume apparently was taking place. The post-war peak was caused partly by an increase in price, but an increase in volume amounting to about 32 per cent over 1900 took place also. Meanwhile, imports of farm products were also increasing, on the whole more rapidly than exports. In this also the peak was in 1919-20. A still larger part of this was due to quantity increase. The first year after the war presented such an excess of exports over imports as to break all previous records of net exports in both total value and quantity. The most impressive fact is that, leaving out of consideration the transition year 1919-20, the value of imports since the war has been maintained approximately at war levels, in spite of declining prices. As a result, in the year 1922-23, the value of agricultural imports exceeded the

² Foreign Commerce and Navigation of the United States.

¹ *Agriculture Yearbook*, 1923, page 1135.



exports by more than fifty million dollars; and this in a time when our farmers were in need of an extension of their foreign markets. Thus the resumption of the prewar trend of disappearing net exports is suddenly threatened.

The net exports of foodstuffs tell approximately the same story, except that the trends are still more striking. Strange to say, the foreign trade in foodstuffs in the seventies showed a deficit. Cotton and tobacco were pre-eminently the farm exports in the earlier days. Grain exports had been growing in importance for some time, but the seventies saw the real development of this trade³ and the beginning of export of refrigerated meats.⁴ They also witnessed the great expansion of the grain fields. From then on, headed by the grain and meat products of the virgin lands of the West, the foodstuffs overshadowed the other farm products in our exports. However, at the beginning of the century another change appeared. The high point of all prewar history in food exports came in 1898 with a value of \$589,988,742, followed in 1901 with another large export amounting to \$582,999,518. From then on until the outbreak of war the total value of foodstuffs exported dwindled in spite of price increases. Meanwhile, the value of food imported more than doubled. In 1912 a net import amounting to \$7,721,075 appeared. The next year net exports were restored, but in 1914 the deficit reappeared with the larger figure of \$44,878,493. War conditions wiped out this trend for a time and in 1919 the net export amounted to more than a billion and a half. This situation, however, did not last, and the calendar year 1923 saw a deficit again, this time amounting to \$41,525,183. In the fiscal year 1923-

24 this figure had grown to \$150,571,996.⁵ This is the striking picture presented by our foreign trade statistics covering the last half century. That the trends are permanent is not assured. Other forces might, conceivably, reverse the trend as the war conditions reversed it temporarily.

THE PRESENT FOREIGN MARKET

The most important agricultural export from the United States in the year 1923 was cotton with a value of unmanufactured fibre amounting to \$807,102,507. In the same year cotton manufactures to the value of \$138,000,106 were exported. Cotton held first place also in 1922, but in the fiscal year 1920-21 the value of the raw cotton export, amounting to \$600,186,000, was exceeded by the value of grain and its products, which passed the billion dollar mark.⁶ Grains and their products, as a class, took the second rank in 1923 with a total of \$311,302,358 in value, after a continuous decline in value since 1920. The nearest competitor of these classes was the complete class of "animals and animal products, except wool and hair," which includes fish in the customs classification. This class of animal products accounted for \$466,657,458 in the exports of 1923. Among the animal products the chief representatives were meats, valued at \$149,967,743; animal and fish oils, valued at \$158,415,723; leather, valued at \$42,883,952; and dairy products, valued at \$27,336,395. Tobacco valued at \$152,303,061; fruits valued at \$67,450,907; and sugar valued at \$28,933,391; in addition, many miscellaneous products were also exported in 1923.⁷

³ Monthly Summary of Foreign Commerce of the United States, Part II, June, 1924.

⁴ Monthly Summary of Foreign Commerce of the United States, Part I, December, 1923.

⁵ Agriculture Yearbook, 1923, pp. 1105-08.

⁶ Agriculture Yearbook, 1923, p. 1113.

⁷ Critchell, J. T. and Raymond J.: *A History of the Frozen Meat Trade*.

Against these exports were imports in all these specified classes and many others. It may seem strange that we import the same classes of products as those which we export. We produce about 18 per cent of the sugar we consume.⁸ The remainder of our sugar consumption heads the list of our food imports with a value of \$380,179,758 in 1923. Wool, likewise, is imported to the extent of somewhat more than one-third of our domestic requirements.⁹ This amounted to \$129,710,711 in value in 1923. Cotton is imported, even though this country exports a large surplus of this fibre. The reason for this is partially that the domestic needs require a certain amount of an especially long staple which is grown here only in limited quantities. Cotton imports to the value of \$49,442,868 came into the country in 1923. Similarly, wheat amounting to 19,501,706 bushels was imported, mainly from Canada, to make up for a deficiency of hard spring wheat which has special qualities making it more valuable for bread-making than the softer wheats of which the United States has a surplus. Largely as a consequence, the United States spent \$24,061,263 for "grains and preparations" in 1923. Tobacco to the value of \$66,855,897, and fruits to the value of \$44,269,231 were also imported in the face of exports. Here bananas, to the value of \$19,738,508, did not compete with any important domestic production. Hides and skins amounted in value to \$118,917,790; dairy products to \$40,854,903; vegetable oils to \$64,517,683; oil seeds to \$68,581,632; nuts to \$25,259,295; and vegetables and preparations to \$25,654,182. In addition to these imports which are largely competitive, raw silk was imported valued at \$391,942,417; coffee at \$189,993,330; cocoa

and cacao beans at \$83,799,019; tea at \$29,928,722; and spices at \$13,639,485. Vegetable fibres are also imported very heavily.¹⁰ The Department of Agriculture estimates that about forty-five per cent of our imports do not compete directly with our own farm production.¹⁰

It is thus apparent that the larger part of the products which we export are subject to the competition of imports, although most of our heavy imports are products of tropical or oriental countries. In the foreign countries our exports are subject, of course, to the full competitive force of the production of other countries.

CONDITIONS IN PURCHASING COUNTRIES

The foreign market for the farm products of the United States spreads over many countries. Some of these countries are themselves large surplus exporters of food and other agricultural products. The chief purchasers, however, are those nations which, being highly industrialized, have a surplus of manufactured products and a deficit of the products of the farm. In prewar days, the United Kingdom was the greatest foreign customer for our farmers. That country took 37.47 per cent, Germany 20.34 per cent, France 8.11 per cent, Holland 4.68 per cent, Belgium 3.01 per cent, and other European countries 10.29 per cent of our farm exports. Thus Europe took 83.9 per cent of all our agricultural shipments in the prewar period of 1910 to 1914. Nevertheless, this export trade was gradually becoming less concentrated. Europe as a whole and the United Kingdom were taking a smaller proportion, while Germany and France were taking an increasing share.¹¹

⁸ See p. 131.

¹⁰ *Crops and Markets*, September 13, 1924: p. 176.

¹¹ Strong, H. M.: *Distribution of Agricultural Exports from the United States*, Department of Commerce Trade Information Bulletin No. 177.

⁹ *Ibid.*, 1923, p. 846.

¹⁰ *Ibid.*, 1923, p. 1002.

Japan must also be counted among the food deficiency nations. She is now a heavy importer of rice, a material part of which comes from the United States.¹²

The Western European nations, as a group, consume more agricultural products than they produce on their own farms. This is not only natural, but inevitable, since an important export trade in manufactured products necessitates a corresponding import trade. Farm products, and other raw materials are unfailingly among the commodities for which such nations exchange the products of their industrial and commercial efforts. England, Germany and France, and to a certain extent some other European nations, not only were aggressively marketing their manufactured products in other countries in prewar days, but carried on extensive world shipping and international finance, and had important and profitable investments in foreign countries. In such circumstances an import trade in farm products, as payment for these goods and services, is unavoidable as the economic world is organized. Moreover, other nations were better prepared than they to expand their food production.

In the years when war-time stringencies directed popular attention more carefully to the food supply of these deficiency nations, the ablest scientists of the leading countries made careful estimates of the food production, consumption, imports, and actual requirements of their nations. The first such study was that for Germany, made by the Eltzbacher Committee.¹³ Following that, Sir Henry Thompson

made a preliminary survey for the United Kingdom.¹⁴ A committee of the Royal Society thereupon worked out more careful estimates¹⁵ and since the war Sir Thomas Middleton has revised these still further, making careful estimates of the domestic animal production which was based upon imported feed.¹⁶ The Interallied Scientific Food Commission also made available comparable data for France and Italy.¹⁷

The final estimates for the United Kingdom indicate that in the prewar half decade only 34 per cent of the food supply came from the home farms and one per cent from the home fisheries.¹⁸ France and Italy were more nearly self-sufficing. France is estimated to have produced 91 per cent and Italy a little over 92 per cent of its own food consumption before the war.¹⁷ Germany also produced the major portion of her own requirements. The Eltzbacher Committee estimated the foreign contribution in calories at 20 per cent of the prewar consumption.¹³

In prewar days the United Kingdom produced approximately 60 per cent of its meat; a little more than one-fifth of its grain; practically all of its fresh milk and cream, including about 90 per cent of all its dairy products; about three-quarters of its fruits and vegetables and less than one-third of its other foods.¹⁷ This latter class includes sugar, of which that country is, practically speaking, not a producer. To maintain this showing in livestock

¹⁴ Thompson, W. H.: *The Food Value of Great Britain's Food Supply*; *Econ. Proc.*, Royal Dublin Society, March, 1916.

¹⁵ *The Food Supply of the United Kingdom*, H. M. Stationery Office, London (Cd. 8421).

¹⁶ Middleton, T. H.: *Food Production in War*.

¹⁷ *Les Ressources et les Besoins Alimentaires des Pays Alliés*, Commission Scientifique Interalliée du Ravitaillement.

¹⁸ Middleton, T. H.: *Food Production in War*, p. 91.

¹² Batchelder, C. C.: *Economic Pressure as a Cause of the Revolt of the Asiatic People Against Occidental Exploitation*; *Annals*, March, 1924, p. 264.

¹³ Eltzbacher, Paul, et al.: *Die Deutsche Volksernährung und der englische Aushemgerungsplan*.

products, a heavy import of feed was necessary. Of the feed concentrates used by the British livestock before the war, somewhat less than two-thirds was imported.¹⁹

France, as we have seen, was more nearly self-supporting. About 87 per cent of her grain, almost all her meats, slightly more than her consumption of dairy products, nearly all her fruits and vegetables and more than two-thirds of her other food were raised at home.¹⁷ The production of animal products depended to a certain extent upon additional imported feeds.

Italy made about the same showing as France with a slightly smaller proportion of home production in grains, but a surplus of fruits and vegetables, and with practically a self-sufficiency in all other foods.¹⁷

Germany credited 10 per cent of her requirements in grains and potatoes to imports. Four per cent of her green vegetables, 30 per cent of her fruit, one-third of her meats and animal fats, 86 per cent of her vegetable fats, 58 per cent of her dairy products and 41 per cent of her eggs were also imported or based upon foreign raw materials. At the same time one-third of her sugar production was exported. In these figures an ample allowance is made for imported fodder.²⁰

This is the picture of the prewar food requirements of the chief nations of Western Europe. At the same time Denmark, Holland and Belgium, and several of the other small nations were importing food and fodder, although some nations, as Denmark, were important exporters of foodstuffs. All the industrial countries of Europe as well as Canada were using our cotton and tobacco, and Italy and France as well as Japan and China were shipping us raw silk.

¹⁹ *Ibid.*, p. 37.

²⁰ Eltzbacher, *Op. Cit.*, pp. 39-75.

RESULTS OF WAR

Great disturbances, of course, have taken place since the war. Our starting point today is not the prewar situation, nor is this our goal. Nevertheless, it probably illustrates more truly than present conditions what the underlying economic forces are and in this way is a guide to the future.

There is a temptation, when social and economic conditions are changed for a time, to become pessimistic and to feel that such disturbed conditions may be permanent. Europe has been a long time recovering. Shall we conclude that the development of Europe in the century before the war was a cyclical affair; that the war marked the reversal of the cycle and that she is now headed for retrogression, or at best a slackening development? Her population growth and increase in wealth have been enormous in the last few generations. Is the future to see the end of this movement? Future history alone can answer this question finally, but our answer today must be that there is absolutely no proof that such a reversal of development is actually taking place more than temporarily. France went through a still more serious upheaval more than a century ago, and subsequent history shows that her progress was far from being stopped permanently. Social and economic upheavals often let loose the forces which are struggling for development and, after the temporary disturbances have passed, the development proceeds more surely than ever.

The war disturbances let loose a flood of neo-malthusian utterances which would fain lead us to believe that man's further progress will soon be checked by a shortage of food. If this school of thought is correct in its forecast of the future, there would seem little question but that the days of growth of

industrialized Western Europe were numbered; in fact, the beginning of the end is already heralded. Those of our farmers who took these theories seriously and based land speculations on their soundness are suffering today. Strange to say, these theories in the past have seemed to attain most popularity in the periods just before new social expansions. They are based largely upon the idea that increase in food production comes only with greater expenditure of human effort per unit of output and proportionate expansion of the farm area. There is so much truth in the contentions of these writers that their conclusions sound plausible. However, they do not place before us the real possibilities of increase from better agricultural technique. The claim is that such advance will be at increasing costs per unit of output. The answer to this claim can only be to point to the facts, which show that, throughout this last century as a whole, agricultural expansion has not caused increasing costs of food, that a decreasing proportion of human population feeds the expanding total population and that the masses of the population are progressively better fed and clothed. The time may come when this will change. In fact, temporary changes have already taken place. However, there were as great reasons to forecast the imminency of fundamental change a century ago as today.

We are inclined to hazard a guess that, when time has given us an opportunity for the proper perspective, the present European debacle will appear as a temporary disturbance in the upward trend of social and economic development. The loss of foreign investments and of some of the grand old social traditions may also be a blessing in disguise for the masses of humanity. We shall, accordingly, base our further assumptions upon

such a theory of the ultimate restoration of European development. The prewar economic status will, probably, never be restored in detail, but this status affords the best available picture of the results of economic forces when they were in free operation. Fundamentally these forces are now quite comparable to what they were then. The population is about the same in numbers and economic wants and only slightly changed in productive skill and ideals. The natural resources are not changed appreciably. The climate is the same. National boundaries are changed somewhat. This will cause some changes in national economy, but no change in that of the group of nations, excepting as new restraints are put upon intra-European commerce. The economic machine is badly smashed, but almost all the parts are there and the skill is still existent to put the machine in working order. The great thing wanting has been social, not economic; a lack of confidence in the future. When confidence is restored, the economic machine will be rebuilt. The prospects today are for a slow but sure restoration of confidence.

If the machine is put into smooth operation again we shall see, not a return to the prewar status, but to approximately the prewar trend with a changed base from which to start. The starting point is the status of the present. The status of the past is, however, the best aid toward estimating the underlying forces.

PRESENT STATUS OF EUROPE COMPARED WITH PREWAR CONDITIONS

Western Europe has more nearly recovered her agricultural production than her industrial activity. Taking Europe as a whole, however, including Russia and the middle eastern countries, it is a question if agriculture has not been set back further than industry.

Unfortunately, it is impossible to arrive at any thoroughly satisfactory estimate of the present condition of either agriculture or industry in some of the countries. Reasonably satisfactory data exist, however, showing the changes in production of crops and number of livestock as an index of agricultural activity and coal production and unemployment as indexes of industrial activity.

The production of wheat in Europe as a whole makes a remarkable showing as compared with that of prewar days. Countries such as Germany and Russia, which have been seriously disorganized, show great reduction in output. However, increases have taken place in some other countries. The U. S. Department of Agriculture estimates a production of wheat for the chief European countries in 1923 of 1,282,966,000 bushels as compared with 1,434,008,000 for the average of the five years before the war.²¹ Beet sugar production is estimated by the same authority at 7,644,370 tons in the prewar half decade and 5,255,947 in 1923.²² The estimate of the prewar cattle population is 129,560,000 and that based upon the latest records (scattered from 1920 to 1923) is 122,818,000.²³ No information is available as to the decreased output in meat and milk per thousand of these animals, and this matter is of considerable consequence.²⁴ Just before the war Great Britain, Germany, France, Belgium and Denmark were credited with 37,810,000 hogs. Today these countries have about 29,249,000.²⁵

²¹ *Foreign Crops and Markets* (U. S. D. A.) March 19, 1924, p. 234.

²² *Ibid.*, April 2, 1924, p. 284.

²³ *Ibid.*, June 18, 1924, p. 536.

²⁴ Merz, P.: *The Food Supply of Germany*; *Manchester Guardian Commercial*, Reconstruction No. 6, p. 359. Also¹⁷, p. 133.

²⁵ *Foreign Crops and Markets* (U. S. D. A.) July 30, 1924, p. 110.

It is impossible to construct from these data a satisfactory index of agricultural activity, but they do indicate that for these items the production has declined by 11 per cent for wheat, 31 per cent for sugar, at least 5 per cent for cattle and about 23 per cent for hogs.

The production of coal is probably as good an index as any that exists to show the rate of industrial activity in Europe. The chief industrial nations, Great Britain, Germany, France, Czechoslovakia, Poland and Holland, produced about 7 per cent less coal, including lignite, in 1922 than in 1913. In 1923, owing largely to the Ruhr troubles, the deficit amounted to about 13 per cent. This deficit varied from country to country. The index of production, based upon 1913 activity, stood at 97 in Great Britain, 62 in Germany (lignite included), 117 for France, 100 for Belgium, and 285 for Holland.²⁶

The index of employment is also a valuable sidelight on the rate of industrial output. This for 1923, as based upon 1913, stood at 90-92 for Great Britain, 92 for Germany, 100 for Belgium, 91 for Holland, Sweden and Norway, and 95 for Denmark.²⁷

One of the best indexes of the business activity of Great Britain is said to be the export of manufactured articles. In 1923 such exports amounted in pounds sterling to 141 per cent of those in 1913.²⁸ Rectifying this figure for the changes in price by the use of the Federal Reserve Board's index number for the price of British export goods, we find that, on the basis of quantity, British exports of manufactured goods in 1923 were only 85 per cent as great as in 1913.

The rate of industrial recovery of

²⁶ *Survey of Current Business* (U. S. D. C.) August, 1924, pp. 226, 227.

²⁷ *Ibid.*, August, 1924, p. 230.

²⁸ *Ibid.*, August, 1924, p. 224.

Europe is fundamentally the best measure of her ability to pay for our farm products. The products of her industrial and commercial life are ultimately the basis for her purchases in the outside world.

Europe's consumption of foodstuffs was increasing in the half century before the war. This was due to increased consumption per capita as well as to an expansion of the population. The fact of expansion of the population is so well known that it requires only passing comment, although it has been an extremely important factor. The increase in per capita consumption is not so well known, and consequently the subject requires more comment.

This increase in the per capita food consumption was more marked in the last century than in the first decade of this century. The annual production of meat in Germany is estimated by German authorities to have risen consistently all through the last century.¹² In 1816 it was 13.6 Kg per capita. In 1907 it was 46.2 Kg, and before the war imports increased the amount available for consumption by 10 per cent. Presumably there was no such important import trade a century ago. In Britain the per capita consumption of meat of all classes was estimated at 75 pounds a year in the middle of the last century.¹³ Just before the war it was about 129 pounds.¹⁴

In France the consumption of meat also increased greatly in the half century before the war. In spite of the fact that the cattle population increased only about 10 per cent and the number of beeves actually decreased, the increased weight of the animals

and their earlier slaughtering age was so marked that the beef and veal production more than doubled in the fifty years leading up to 1913.¹⁵ During this period the French foreign trade in meats was too small to cause much difference between production and consumption.¹⁶ Hence it is safe to conclude that the beef and veal consumption of France doubled in the same time. It is estimated that further increases have taken place in France since the war.¹⁷ In most other European countries, notably Germany,¹⁸ decreased consumption has been the rule since the war, but a decided tendency exists to make up the deficiencies.

In the latter part of the last century consumption of wheat and barley also increased in various European countries.¹⁹ Scattering evidence indicates also that the consumption of miscellaneous foods increased and that more textiles were used.²⁰

These increases came with increased prosperity among the masses. In the half century before the war real wages were advancing in England and also on the Continent.²¹ The advance was checked at the first of this century, and at the same time the increase in consumption was slackened. The evidence available from many sources

¹² de Lapparent, M. H.: *Elevage des Bêtes Bovines* (1913).

¹³ Lucas, J. E.: *Le Marché de la Viande en France* (1917).

¹⁴ *Foreign Crops and Markets* (U. S. D. A.) June 18, 1924, p. 546.

¹⁵ Hess, R. H.: *The German Food Situation and Import Requirements of Breadstuffs, Meats and Fats for 1924* (U. S. D. A.).

¹⁶ Taylor, A. E.: *The European Situation as Affecting Demand for Wheat*; address before National Wheat Conference, Chicago, June, 1923.

¹⁷ Nourse, E. G.: *American Agriculture and the European Market*, p. 263.

¹⁸ Kitchin, Joseph: *Trade Cycles Chart, The Times*. London, January 28, 1921.

Mahaim, E.: *Changes in Wages and Real Wages in Belgium, Journal of the Royal Statistical Society*, Sept., 1904, pp. 430-38.

¹² See p. 133.

¹³ Critchell, J. T. and Raymond J.: *A History of the Frozen Meat Trade*, p. 2.

¹⁴ *Foreign Crops and Markets* (U. S. D. A.) January 2, 1924, p. 546.

indicates that food consumption in England and France has largely recovered from war shortage, but that in Germany it is very much below normal.

What the future may bring forth in changes in rates of consumption is not easy to determine. It is evident that the increased consumption was very much in order during periods when industrial income was rising more rapidly than agricultural prices. This manifested itself strikingly in the last half of the last century. In the half generation before the war when agricultural prices were recovering from the results of the over-expansion onto new lands, this trend of higher real wages and increased consumption was retarded but not as definitely reversed as were farm prices. Apparently, the comparative increase of farm prices was a return from a temporary disturbance to the more normal balance between such prices and prices for industrial goods, and the fundamental trends for each set of prices proceed approximately together.

Taking a view of the past century with its ups and downs, the masses had increased real wages and manifested a strong tendency toward increased consumption, especially of the choicer foods. It seems logical to conclude that the tendency toward higher standards of consumption will be resumed as soon as possible, but probably with a milder degree of increase. It would seem that the well-to-do classes were already amply nourished, but that certain large elements in the population are still undernourished.³⁸

It should be noted before passing that Europe's share in our exports of farm products for the three years 1920-22 was 77.17 per cent as compared with the 83.9 per cent previously noted for 1910-14. The decreases came largely in exports to Britain and Ger-

many. The United Kingdom took 32.93 per cent in the later period against 37.47 per cent in the former. Germany's share fell from 20.34 per cent to 10.45 per cent.³⁹ In view of the greatly decreased purchasing power of Europe, this limited decrease in the proportion taken from our agricultural exports is interesting. Europe was not in need of less farm products, but was less able to pay. As a result, our surplus being insistent, she maintained the amounts purchased quite amazingly, but cut the prices.

This question of the purchasing power of Europe is so complex and so inextricably bound up with the relative selling positions of other surplus producers of farm products and with the matter of our balance of trade and Europe's debts to us, that its discussion must be reserved until later.

CONDITIONS IN OTHER PRODUCING COUNTRIES

It will be impossible, within limited space, to discuss fully the abilities of other surplus producers of farm products to compete with us in our foreign market. A brief discussion, however, will serve to present the most important elements in this situation.

Eastern Europe was of great importance to Central Europe as a source of foodstuffs and other farm products before the war. Germany imported these products heavily from Russia. Austria proper depended largely upon those parts of the dual monarchy now established as separate nations. Russia and southeastern countries of Europe were also heavy exporters of grain to other countries before the war. In the half-decade 1910-14, out of a total annual export of wheat from all the chief surplus as well as deficiency nations amounting to 805,578,000 bushels, Russia exported 164,862,000 bush-

³⁸ Starling, E. H.: *The Feeding of Nations* (1919).

³⁹ See p. 132.

els, Roumania 54,630,000, Hungary 49,116,000 and Bulgaria 11,182,000.³⁹

Over one-third of the international wheat trade of the world came from these countries of Eastern Europe. In addition, many other agricultural products were exported, notably butter, eggs, hides, coarse grains, flax, hogs and poultry from Russia⁴⁰ and corn and other coarse grains from the Danubian countries. The whole economic life of these countries is disorganized today. How long it will take for it to be reorganized is a matter of conjecture. The exports from the Danubian countries have been cut down drastically;⁴¹ from Russia they totally disappeared and are now attempting to show themselves again in feeble fashion. During and since the various revolutions the system of land tenure has undergone notable changes away from large holdings under central management toward small individual holdings.⁴² Opinions differ as to the future effect of this on the exportable surpluses. In Russia the change in land ownership had already gone far before the revolution. The revolution has increased the peasant holdings from 80 to 96.8 per cent of the total available.⁴³ For the Danubian countries the statement is made:

During the last four years the peasants have made great efforts for the restoration of agriculture. They set no limit to their working time, work 18 hours a day in summer, and their effort is made noiselessly and almost instinctively.⁴⁴

It is generally claimed that the change will tend toward smaller atten-

tion being paid to grain crops for export and more to the raising of livestock. It must be remembered that the state of education and the standard of living in these countries are not of the highest, consequently developments are likely to be slow. One writer points out that even under the old organization Russia was much slower than other countries to develop her trade.⁴⁵ The natural resources are present in this eastern plain of Europe which extends, roughly speaking, over the Danubian countries and Russia. These countries were the granary of civilization before the dawn of history, and will, to a notable degree, be so again. The social elements involved stand in the way of rapid progress. It is possible, however, that new types of social and economic organization will appear with or without the help of Germans and other outsiders, which will cause a new development in this section of the world. The recovery of the prewar supplies is the maximum that the outside world can reasonably expect, however, for a considerable number of years and even this is slow in appearing.

Asia makes some important contributions of agricultural products to the outside world. These are largely confined to sugar from Java, the Philippines and Formosa; cotton and wheat from India; rice from India, Indo-China, Siam and Korea; small amounts of meat from Indo-China and Shantung; and eggs from China; excepting products which do not compete with our agriculture. These latter products, including vegetable fibres, carpet wool, tea, coffee, spices and rubber, are very important exports.

The warmer countries in Asia exporting products which compete with ours are mostly densely populated and, as a rule, more likely to turn into importers than to become formidable

³⁹ *Agriculture Yearbook*, 1923, p. 623.

⁴⁰ Anderson, B. M., Jr.; *Germany and Russia*, Chase Econ. Bulletin II, 2.

⁴¹ *Manchester Guardian Commercial*, Reconstruction No. 14, p. 331.

⁴² *Ibid*, Reconstruction No. 6.

⁴³ *Ibid*, Reconstruction No. 6, p. 377.

⁴⁴ *Ibid*, Reconstruction No. 14, p. 831.

competitors in the export trade. There is said, however, to be large room for expansion of production of sugar and other tropical products on the islands and, eventually, of products of the temperate zone from Manchuria and Siberia. These latter countries threaten no immediate competition of importance, although Siberia had an important butter export before the war.⁴⁵ Asia, under present conditions, will probably not be an important low cost competitor within the near future.

Africa has great potentialities as a producer. France is already getting valuable contributions of agricultural products from her African colonies, and England from hers and Egypt. Developments in Africa have been slow, and will probably not be pushed until higher relative prices overcome the inertia which stands in the way of the real development of that continent. When the inertia is overcome, however, the more temperate zones and the mild plateaus in more tropical zones may well become low cost producers. The natural resources are said to be present and there is an abundance of labor comparable to our southern labor, if it can be induced to work. There is some immediate competition in meats, wool, grain and cotton.

South America is now a very keen competitor in our market for farm produce and the opportunities there for expansion on to new low cost land are still very large.⁴⁶ The Argentine is the most highly developed section as yet, for its climate is ideal for farming and its agricultural resources are similar to those of our prairie. For years its wheat, beef and corn have been driving ours off the European market and its beef and corn at times invade our domestic market. Her

acreage of wheat and corn developed rapidly until about 1910 and of oats and alfalfa right through the war. The livestock census of 1914 indicated a decrease in cattle, but the census is considered to be inaccurate, and the exports of beef developed rapidly until the shipping shortage in the last part of the war caused a decline.⁴⁷ The war checked the exports for a time, but in these last few years the Argentine has recovered from us her place on the European market.⁴⁸ Agriculture in that country, in spite of its present development, has abundant room for expansion while still exploiting the virgin resources of the soil. It is estimated that wheat can be produced on an area ten times that of the present wheat fields.⁴⁹ Moreover, her supplies of fuel are too limited to form the basis for any great industrial expansion of her own. The Argentine also is successful in using the immigrants from Southern Europe in her agriculture and the potential supply of these at present is large.⁵⁰

There are many other parts of South America which have already entered the market and great expansion of production is possible eventually. Uruguay and southern Brazil are developing quite rapidly, but have not yet shown their real capacity. Southern Brazil, as well as some other parts of South America, is sufficiently high in altitude to offset in some measure the nearness to the Equator. Not only are sub-tropical products being raised, but competition is being threatened for our beef⁵¹ and cotton exports.⁵² Much of South America

⁴⁵ *The Economic Development of the Argentine Republic in the Last Fifty Years*, published by Ernesto Tornquist & Co., Ltd., Buenos Ayres, 1919.

⁴⁶ Nourse, E. G.: *Op. Cit.* p. 210, 211.

⁴⁷ *Foreign Crops and Markets* (U. S. D. A.), January 16, 1924, p. 57.

⁴⁸ *Manchester Guardian Commercial*, American Cotton Number.

⁴⁹ Reports of the Siberian co-operative associations.

⁵⁰ Pearse, A. W.: *The World's Meat Future*.

is like Africa in its potentialities, in that it will not be used largely until lands in the older countries are better cultivated.

Australia and New Zealand are our keen competitors on the world market. New Zealand is small and fairly well developed, but still has abundant resources for expanding her production of grain, beef, mutton, lamb, wool and dairy products, which she sells largely to England and in smaller degree to us. Australia has enormous area, but much of it is almost desert and the development of her exports has been very irregular on account of disastrous drought. Nevertheless, Australia has been expanding her farm net exports for years, while ours have been contracting and today her trade in similar products to those exported from New Zealand is very important. She also produces some cotton⁵¹ and sugar⁵² in her more tropical section. Australia is already a great producer and will expand her production, although probably slowly.

Canada offers very real competition to our farmers in some lines. The fruit and dairy products from the east, and the grain, livestock and dairy products from the west compete with the products of our farmers both at home and abroad. Western Canada is still in the "mining" stage of agriculture and, as a consequence, her current costs of production are low.⁵³ The development of the West has been rapid in these last fifteen years and this development is not due to the war, but to the efforts in railway building and land settlement already put forth before war was in sight. The development is permanent and can be pushed very much further; how far is a matter

of dispute. It is safe to say, however, that with the available land resources and the potential immigration from Great Britain as soon as farming gives greater promise of profit, Canada will expand her output much further and that without materially increasing the unit cost of production.

The production of the farms of Western Europe itself offers us the greatest competition of all in the markets of those countries. Even in Britain, the gross output of the farms is much greater than the thirty-four per cent of the consumption, and agriculture, according to the prewar census, was the greatest industry in the country in terms both of net output and people employed.⁵⁴ It is a common assumption that England has been driven to food importation on account of scarcity of land at home. This assumption is without foundation. England turned to the importation of food because it was cheaper to buy the food than to raise it.⁵⁵ If the primary influence had been a greater expansion of demand than her own farms could supply, the result would have been increasing prosperity for domestic agriculture. The very opposite took place. Three and a half million acres of land went out of cultivation in England during the half century before the war.⁵⁶ When confronted with the products of what is termed the "mining of virgin soil" in new lands, the British farmer turned in distress from one effort to another⁵⁷ without much avail until a new balance was struck at the beginning of this century.⁵⁸ Leading British authorities agree that the agricultural possibilities

⁵¹ Oxford Survey of the British Empire, British Isles, p. 218.

⁵² Prothero, R. E.: *English Farming, Past and Present*, pp. 374-392.

⁵³ Hall, A. D.: *Agriculture after the War*.

⁵⁴ MacDonald, James: *Food from the Far West* (1878) p. ix-xvi.

⁵¹ *Agriculture Yearbook*, 1923, p. 804.

⁵² *Ibid*, 1923, p. 851.

⁵³ U. S. Tariff Commission; *Wheat and Wheat Products*, 1924.

of their country permit of a much greater home production of food.⁵⁸ One prominent authority claims, very optimistically, that, if all the farmers would duplicate the practices of those who really farm their land carefully, the nation would be self-supporting in food. He also shows that the farmers who follow such careful practices made good profits in contrast to the unhappy results of the more common types of farming.⁵⁹ Another more conservative writer shows that more intensive farming methods would not only give much greater production but would also be more profitable to the farmers over a large enough number of years to secure average conditions.⁶⁰

As we have already shown, the continental countries are more nearly independent of the outside for their foodstuffs. France supplied herself with about ninety per cent of her food requirements, and did this with but indifferent efforts, before the war.⁶¹ Germany, which was the second greatest importer of foodstuffs, purchased only twenty per cent of her consumption before the war and her true requirements are said to have been over-supplied.⁶² Moreover, there is no reason to suppose that even the German farmer before the war had exhausted nearly all the possibilities of agricultural technique known today; and greater advances seem still to be discoverable.⁶³

⁵⁸ Hall, A. D.: *Agriculture after the War*.

Middleton, T. H.: *Food Production in War*, etc.

Fielding, Charles: (*Agricola*); *Food*, etc.

⁵⁹ Fielding, Charles: (*Agricola*); *Food*, pp. 89-94.

⁶⁰ Middleton, T. H.: *Food Production in War*.

⁶¹ Morel, Comper: *French Agriculture Since the War*; *Manchester Guardian Commercial*, Reconstruction No. 6, p. 358 (August 17, 1922).

⁶² Starling, E. H.: *The Food Supply of Germany during the War*; *Journal of the Royal Statistical Society* March, 1920, p. 225.

⁶³ Fielding, Charles: *Food*, p. 108.

The types of agriculture to which we are coming with greater development and to which Europe must come will be more alike than either will resemble the production in the newer countries. This should make our farming still more competitive with theirs. Europe has cheap labor and plenty of it. The use of machinery is not so highly developed as in this country. Increase of competition in these markets from their own farms will depend largely upon the intelligent effort expended on improving the farming technique and pushing farming operations. The application of such effort, in turn, will depend largely upon the degree to which it will continue to pay these countries to devote their energies to industry and commerce, rather than to agriculture. The immediate prospect is that their best efforts will be devoted to the restoration of their commercial activities, particularly with countries producing a surplus of agricultural products. This situation rather than lack of facilities for home production of food will be the limiting factor in the development of European agriculture.

THE STATUS OF OUR TRADE IN THE MORE IMPORTANT PRODUCTS

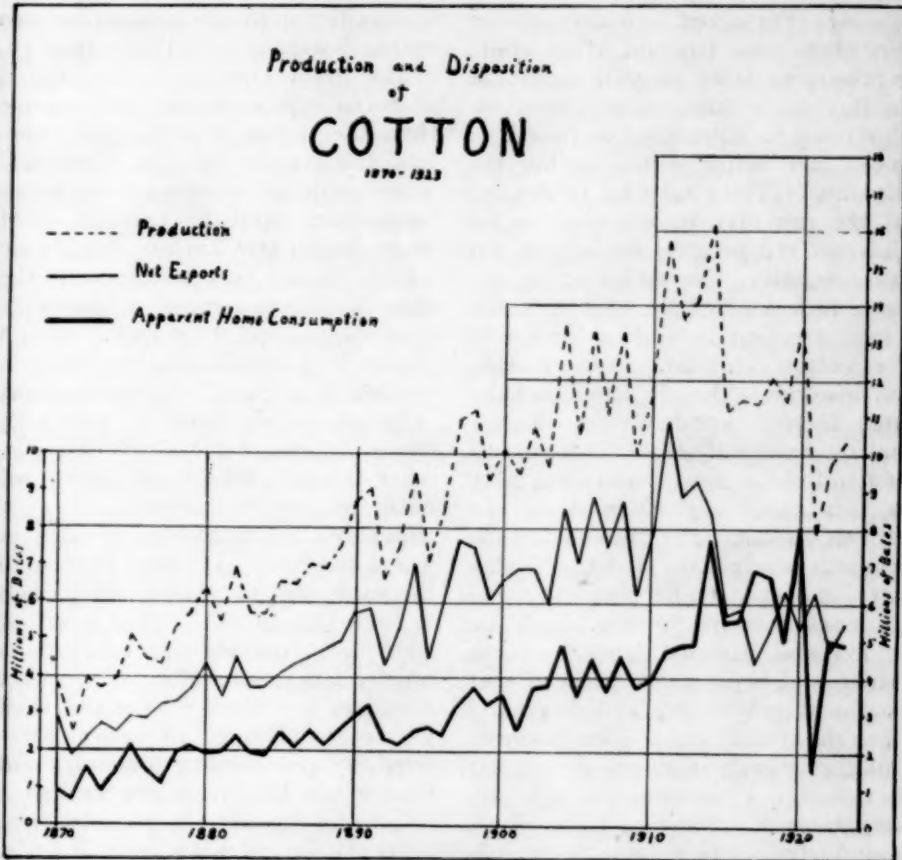
A brief presentation of the situation in the trade in the chief commodities among our agricultural exports should be helpful.

Cotton, which is our banner export product, has always found its largest foreign market in England. Nevertheless, in the latter part of the last century, when the total exports of cotton were increasing very rapidly, Germany greatly increased her demands for this fibre and France and Italy also became important customers. In 1923, the United Kingdom took 1,580,916 bales, Germany 1,011,614

bales, Japan 674,008 bales, France 658,077 bales, Italy 533,811 bales, Canada 193,028 bales, Spain 171,529 bales, and Belgium 161,062 bales out of a total export of 5,279,165 bales.⁶

production,⁶⁵ as portrayed in the accompanying chart.

In the year 1922-23 the United States produced 9,761,817 bales of cotton out of a world total crop esti-



The export of cotton in these last few years has been affected by our short crops as well as by the slackened foreign demand. Our production has been seriously curtailed by the ravages of the boll weevil and recently has been threatened by the pink boll worm, which is a new pest for this country.⁶⁴ Meanwhile our consumption has been increasing more rapidly than our

estimated at 18,705,000 bales. In 1909-13 the United States production was 13,033,235 out of 23,580,000 bales.⁶⁵ Doubtless, a normal world crop in these last few years would have been disastrous to the producers, but it appears also to be true that the high prices due to short crops have seriously hampered the textile industries and, as a result, have greatly injured the

⁶ See p. 131.

⁶⁴ *Agriculture Yearbook*, 1921, pp. 323-406.

⁶⁵ *Ibid*, 1923, p. 796.

⁶⁶ *Ibid*, 1923, pp. 802-04.

market for our other crops. In this way dear cotton makes cheap hogs. As we have already noted, the domestic mills are taking an increasing part of our own crop. This situation has long caused worry to the industry abroad. For about two decades the British Cotton Growing Association, representing labor as well as capital in the textile industry, has been endeavoring to stimulate the growth of more and better cotton within the Empire.⁶⁷ The results up to the end of the war may be described as indifferent and progress during the war was negative. Nevertheless, it has been brought to light that in many places excellent natural facilities exist for cotton growing. India already produces more than four million bales and Egypt considerably over one million bales annually. The production in India is growing and the quality is being gradually changed to suit British needs. The production in Egypt is nearly static, but the Soudan is being opened up for production and promises material results, both on humid and irrigated lands.⁶⁸ South Africa and many other parts of that continent now under British control have the climate and soil for this crop, but the labor, though racially similar to that in our own cotton belt, is still very inferior. Many of these places and Australia are making beginnings in cotton production and promise results in the future if the United States supplies are reduced still farther.⁶⁹ Recently the Empire Cotton Growing Corporation has taken hold of the work of expanding this produc-

tion and has been given the right by law to levy a tax for the expansion of its efforts on all cotton purchased by spinners in Great Britain.⁷⁰ England is determined on this matter now and the United States will find serious competition in this crop unless her own output is expanded and costs reduced.

The grain exports of the United States have, as a rule, been of less value than the cotton exports. Nevertheless, the export trade in wheat and other grain has assumed tremendous proportions at times. Wheat, and wheat flour in terms of bushels of whole wheat, became very prominent in the exports in the seventies. A temporary peak was reached about 1880. After a decline for a decade, another peak was reached in 1892. The greatest export of prewar history came in 1902 with the equivalent of 234,773,000 bushels. After this an irregular decline ensued until just before the war. The war stimulated unprecedented exports of wheat and flour. The total went up to the equivalent of 332,465,000 bushels in 1914-15. In 1920-21 the record of 366,077,000 bushels was made on a rapidly falling market.⁷¹ The United Kingdom has always been the chief purchaser, although in prewar days Germany purchased extensively, and France less heavily, when we had a surplus for export.⁷² In these last two years the United Kingdom still leads. The customs records claim an export of 16,463,247 bushels of unground wheat to the United Kingdom and 24,539,647 to Canada in 1923. This shipment to Canada was almost certainly either shipped through or re-exported after milling, the export of United States grain through Montreal having been very heavy these last few years. Italy

⁶⁷ Annual Reports of the British Cotton Growing Association.

⁶⁸ Cotton Growing in the Soudan, publication of the British Empire Cotton Growing Association (1913).

⁶⁹ Himburg, W. H.: The Part Played by Our Empire in the Production of Raw Cotton; *Journal of the Textile Institute*, June, 1924.

⁷⁰ *The Board of Trade Journal*, October 11, 1923, p. 372.

⁷¹ *Agriculture Yearbook*, 1923, p. 1113.

⁷² See p. 129.

took 15,817,247 bushels. Holland is also charged with a large amount, 6,433,247 bushels. Here again, probably at least a substantial portion eventually found its way further, this time to Germany. Belgium, France, China and Japan are also charged with substantial amounts. The year 1923 shows a total export of 116,490,023 bushels of wheat in the form of grain, and the equivalent of 189,884,275 bushels including flour.⁶ Wheat is also imported to a certain extent. In pre-war years these imports were irregular. In 1920-21, 51,004,000 bushels came in and a substantial amount has appeared each year since.⁷² This is largely due to the superior quality of hard spring wheat for bread-making. We do not produce enough of this quality for our own use while Canada produces it very extensively.

Corn is also exported, although in smaller quantities. Again we find a rapidly rising export up to the last of the nineties, when an average of 192,531,000 bushels was attained. From that time on until just before the war the corn exports fell irregularly to 10,726,000 bushels in 1913-14. The war stimulated somewhat larger exports but post-war demands have broken the war records. In the year 1921-22, 179,490,000 bushels were exported.⁷¹ In 1922, 163,609,213 bushels were exported, chiefly to Canada (which really uses at least some of the corn herself), Germany, the United Kingdom and Holland. In 1923 the quantity had fallen to 42,187,732 bushels in total.⁶ The imports of corn had been increasing in prewar years, reaching the total of 12,367,000 bushels in 1913-14. In 1919-20 10,229,000 bushels were imported, but since then the imports have been small.⁷³

Other coarse grains and oil-cake

meal are also exported, principally for the livestock of Western Europe. Oil-cake and other protein concentrate feeds and oil seeds are also imported.⁶

Rice and rice products are important in our foreign trade. Prior to the end of the war the imports surpassed the exports. In these post-war years, however, the imports have decreased rapidly, while the exports have risen to large figures.⁷³ In 1923 the exports of rice and its products amounted to 348,838,531 pounds. Japan was the chief market, with 61,427,534 pounds. The United Kingdom followed with 43,467,547 pounds. Canada, Belgium, France, Chile, Holland, Argentina, and France also were important customers.⁶

Our foreign grain market does not hold forth such good promise as the market for cotton. When we stop to consider the situation that will probably develop within a comparatively few years, when Eastern Europe is again producing for export and Canada has one of her periodical bumper crops, the future does not look bright. Canada alone is perfectly capable of producing half the world's import demands in wheat. She can do it in a good year without further expansion. Add to this the one-third of the world's requirements formerly produced by Eastern Europe and there is but little room for the supplies from the southern hemisphere. Moreover, the Canadian wheat, as already noted, has milling qualities superior to the type which this country is ready to raise for export. Last, but not least, the cost of production is lower in Canada, according to the findings of the Tariff Commission, and the cost of transportation to the seaboard is also lower.⁷³ In such circumstances, it would seem best for the American farmer to devote his energies to something else than wheat for export.

⁶ See p. 131.

⁷² *Ibid*, 1923, p. 1096.

⁷³ See p. 144.

⁷³ *Agriculture Yearbook*, 1923, p. 1114.

⁷³ See p. 141.

There is a demand for feed grains and Canada cannot compete on corn and cotton-seed products. The Argentine, however, can compete with us successfully in selling corn. The cotton-seed products and other protein concentrates can probably be retained at home with advantage and converted here into animal products, thus saving the nitrogen for our soil. Corn also can be, and is, best exported in the form of pork. These last two items are practically one in the export market and will be considered under the heading of animal products.

The exports of dairy products were fairly important in the last quarter of the last century.⁷⁴ From then on until the beginning of the war the exports of butter and cheese steadily declined. The butter trade turned to a net import in 1914, while the cheese trade became a net import in 1905 and reached the greatest deficit in 1914.⁷⁵ During the war and immediately thereafter, exports of butter and cheese again exceeded the imports and condensed milk assumed an importance in the export trade.⁷⁶ This latter persists as a net export in itself. Butter and cheese have again become net imports and the total of all manufactured dairy products amounted to a net import of nearly half a billion pounds of milk equivalent in 1923. This is a larger deficit than before the war. In addition to this net import of manufactured products, in the year ending March 31, 1924, Canada shipped in 2,783,866 gallons of cream and 2,191,395 gallons of milk. There is such a tendency today toward recovery of the former export trade of the old surplus producers in the northern hemisphere and such an ex-

pansion of production in the countries south of the equator that we may, for a time at least, anticipate stronger rather than weaker international competition.⁷⁸

We still maintain a net export of eggs in spite of the dried and frozen eggs which come in from the Orient. In fact, this is one farm product whose net export is consistently increasing.^{75, 77} We have had no deficit since 1896. The net export was increasing before the war and we still have a considerable trade in spite of the decline from war years. Nevertheless, our export trade is small when compared with our total production. Cuba was our best customer in 1923, followed by Canada, Mexico and the United Kingdom.⁶ Poultry products may be shipped increasingly, for they are the product of settled rather than frontier agriculture. There is a real demand abroad for high-class eggs, as shown by the success of the Danish trade, but the United States exports fewer eggs than does that one small country.⁷⁸ The future possibilities of the poultry products market and that for dairy products are not dissimilar. There will eventually be ample demand, and we can produce the products. The question that determines the real development of such commerce is as to whether or not our domestic demand will continue to expand more rapidly than the production.

Our fruit trade contains important exports and important imports. In 1923 the exports were valued at \$67,450,907 and the imports at \$44,269,231. Of the imports, bananas accounted for \$19,738,508. The remainder was largely competitive with our

⁷⁴ Pirtle, T. R.: *Handbook of Dairy Statistics*, U. S. D. A.

⁷⁵ McFall, R. J.: *Livestock and Animal Products Statistics, 1909-19*; publication of Dominion Bureau of Statistics, pp. 129, 130.

⁷⁶ McFall, R. J.: *Economic Studies, Business Conditions*, No. 12.

⁷⁷ *Agriculture Yearbook*, 1923, p. 1111.

⁶ See p. 131.

⁷⁸ McFall, R. J.: *Economic Studies, Business Conditions*, No. 9.

own production. The largest item in the export list is apples, which were valued at \$16,212,399. The United Kingdom was the chief customer for these. Next in order were oranges with a value of \$8,478,712 going largely to Canada. Pears exceeded all the remaining fresh fruits with a value of \$2,521,493. Raisins were valued at \$7,627,291. For these Canada was the largest customer, and the United Kingdom was second. Prunes amounted to \$5,211,262 and apricots to \$2,383,321. Western Europe and Canada are our chief customers for these. Canned fruits accounted for \$15,076,085 among our exports. Of these the United Kingdom takes about two-thirds in value.⁶

Our foreign trade in fresh fruits is largely with Great Britain and Canada. The latter country takes great quantities of our citrus fruits and will probably continue to take them. Great Britain is a valuable market for fresh fruit, but the Continent has always offered difficulties in the expansion of such a trade. Increasing prosperity should bring increased demand. Our chief competition in the sale of deciduous fruits on the British markets comes from Canada, the production in the southern hemisphere coming at a different time of year from ours.

The market for dried and canned fruit is large and it should be possible to expand this increasingly without fear of disastrous competition.

Tobacco has been an important export since colonial days. In 1923 the exports were valued at \$152,303,061, and the imports \$66,855,897. The exports went to a wide list of countries with the United Kingdom easily in the lead, taking an amount valued at \$79,994,729.⁶ China and Australia were next in the line of customers, and all the leading Western European nations purchased important amounts. In spite of

the fact that tobacco is one of our earliest exports, it has shown a consistent increase in export and, while the shipments grew somewhat during the war, they have been maintained recently at levels higher than the prewar.⁷⁹

The history of our foreign trade in beef and its related products shows an expanding export up to a high point of about 1,175,000,000 pounds in 1906, a very rapid decline to a large net import in 1914, a modest recovery of net export during the war, since when the net exports have declined. The ordinary figures on beef exports tell only a part of the story of the foreign trade connected with our cattle industry. During the period of heavy export, the shipments of live cattle to England ordinarily accounted for more than one-half as much as our shipments of dressed beef and beef fats taken together. Since 1912 the movement of cattle has been inward, largely from Canada in the form of "feeder stock" for fattening in the corn belt. In 1919 this movement reached the high total of 642,395 head of cattle. Since the war our exports of live cattle have re-appeared and exceeded the live imports in 1921 and 1922. With these exceptions, the estimated slaughtering weight of the imports has exceeded that of the live exports. The exports of dressed products include very heavy amounts of beef fats. The heaviest recorded shipments go to Holland, the ultimate destination for a large part probably being England. It is impossible to separate all the beef products in the customs records, but the error involved from neglecting the miscellaneous items is not large. A somewhat larger error appears in estimating the slaughtering weights of the live animals imported and exported. The accompanying chart is based upon computations which eliminate these errors as far as

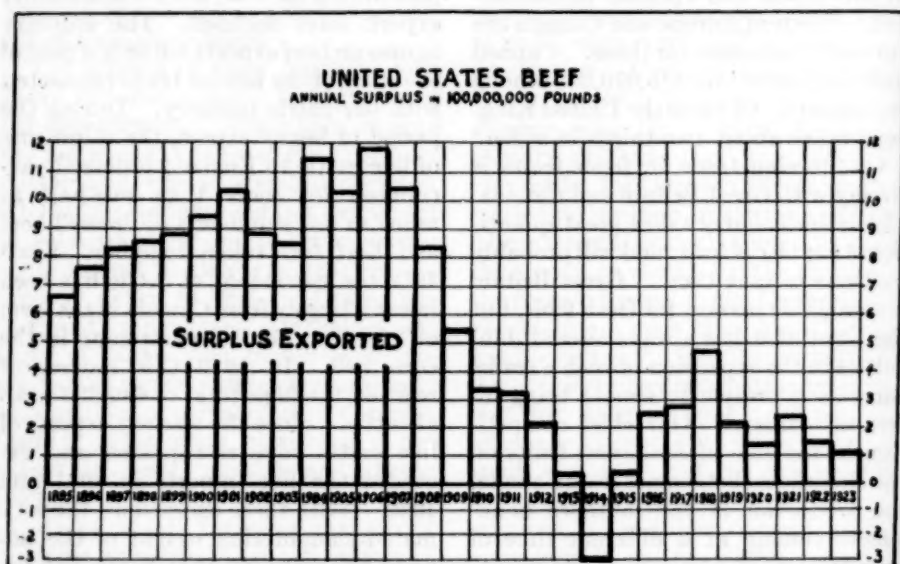
⁶ See p. 131.

⁷⁹ *Agriculture Yearbook*, 1923, p. 1113.

possible and show the net imports and exports of beef, including fats, and live animals reduced to meat equivalents. Had not the fats been included since the war the chart would have shown a net import in this late period. It must also be remembered that, in addition, we have a net import of cattle hides of very large proportions. In 1923 this amounted to 268,071,688 pounds with a value of \$43,672,821.⁶

The present export demand for beef

the United States practically disappeared on the British market during that period. Recently, according to the Department of Agriculture, the costs of production in the Argentine appear to be materially lower than ours.⁸⁰ The average exports from that country for the years 1921 to 1923 were 56 per cent above the average for 1909-13.⁸¹ Uruguay and Brazil have also increased their exports materially and can readily continue the



is large, but we have difficulty in competing with other countries and that difficulty will likely continue. The chief competition in beef exports comes from the southern hemisphere. England is the chief importer and in the decade before the war she so expanded her sources of supply that the trend of the average import price was actually downward, while our price trend was very markedly upward.⁷⁸ It is no wonder, in such circumstances, that the supplies from

increase. South Africa offers considerable possibilities in the export of beef and already contributes to world trade.⁴⁶ The beef market has been unprofitable recently for New Zealand and Australia and their output is not being developed as rapidly as it might were the competition from South America less severe.⁸² Market con-

⁸⁰ Arner, G. B. L.: *The Cattle Situation in Argentina* (U. S. D. A.) 1924.

⁸¹ *Foreign Crops and Markets* (U. S. D. A.) June 18, 1924, p. 547.

⁸² See p. 140.

⁷⁸ Weddell & Co., 36th Annual Report of the Frozen Meat Trade (1923).

⁶ See p. 131.

⁷⁸ See p. 164.

ditions which would be profitable for American producers would probably greatly stimulate production in Australasia. It is estimated that the world total cattle population has increased by 24,000,000 head since before the war. This figure may be an exaggeration on account of the vagaries in the Argentine census reports, but it is certain that the cattle population has increased greatly in many of the surplus producing countries. The foreign market is now taking large quantities of beef fat from us and this may continue. It appears to be quite certain that the American corn crop can compete on the world's markets when converted into animal fats. If it were not for the opposition of those who raise cattle for sale as feeders, the farmers of the corn belt could probably expand their profits from fattening Canadian feeder cattle for the export market. Even with a high duty there is now a large import of such stock for fattening and this helps along what little beef export that does exist.

The foreign trade in mutton and lamb, including sheep and lambs, in meat equivalent, is distinctly on the net import basis and has been, with the exception of a few scattering years, since 1897. The war did not serve to reverse this situation, but rather made it stronger until 1917. Since the war, each year has broken prewar records of net import and in 1920 the high point of 103,000,000 pounds was reached.

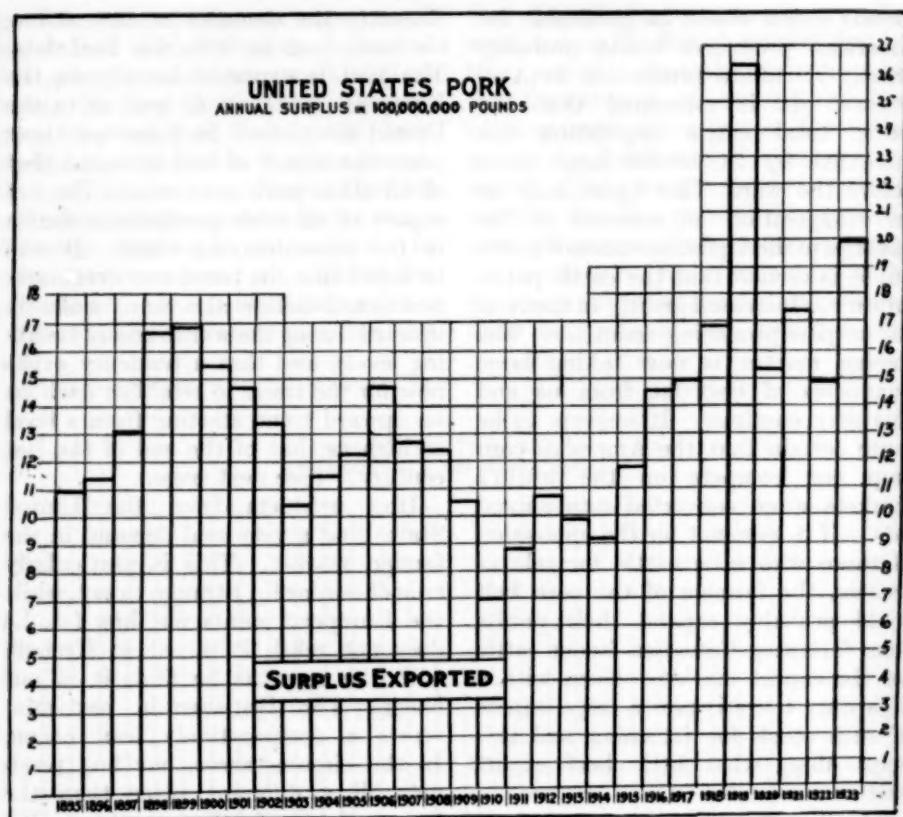
The reduction of the pork trade to the basis of a net figure for all products live and dressed, is of importance chiefly in summarizing the data for the various kinds of meat and fat. In no case is the international movement of live hogs noteworthy. There are, however, great changes in the foreign demand for dressed pork products.

Recently the demand is very strong for lard, just as it is for beef fats. The lard is exported heavily to the European continent as well as to the United Kingdom. In these last three years the export of lard exceeded that of all other pork products.⁶ The net export of all pork products is shown in the accompanying chart. It will be noted that the trend was irregularly downward before the war, violently upward during the war to record breaking levels, and that a tendency exists now for the trade to establish itself on an upward trend starting from a level as high as that of the end of the last century. (See next page.)

Hog products from the United States find a very real demand in the foreign market. This is particularly true of our lard. Strange to say, while the European wants our hog fat, he does not relish it mixed so strongly with the meat as he finds it in our bacon. The Britisher in particular wants a comparatively lean bacon. In the circumstances, our hog products fill a different place than the hog products of other countries. We probably could not compete with what is known abroad as the "bacon" type of hog, which is relatively thin and meaty. Neither can we sell our fat bacon to the best advantage.⁷ We can, however, sell the clear lard without a great deal of direct competition. Our efficient hog production is based upon corn feeding. That makes fat efficiently. The combination between the climatic and soil conditions of the American prairie, the lard type of hog and American farming methods appear to present a very efficient means of producing a kind of fat much sought after in foreign markets. The Argentine and parts of the Danubian

⁶ See p. 131.

⁷ Commerce Reports (U. S. D. C.) October 9, 1922, p. 86.



country have the natural facilities for this production and may eventually develop it, but have shown no marked indications of such development as yet. There probably are other things which those countries can do to better advantage unless the American product becomes considerably more expensive on the world's market.

It may be said briefly that no lack of foreign demand or presence of undue competition threatens our export of cotton, pork and other animal fats. The chief danger of losing this trade lies in our possible failure to supply ample quantities at favorable prices. As our economic life develops it also is probable that there will be ample opportunity to export more highly

specialized raw farm products, such as fruits, and we should find increasing outlets for manufactured goods based upon farm products.

THE INFLUENCE OF DEBT PAYMENTS AND THE BALANCE OF TRADE SITUATION

The influence of our general foreign trade situation, including the payments on debts due from European countries, is frequently regarded as a serious obstacle to the healthy development of our export trade. Half a century ago, when the value of our exports and imports was small, the effect of interposing such an "invisible" item into our balance of trade would have had very far-reaching

effects. Today the proportions of our foreign trade are such that any debt payments now arranged, or likely to be arranged, can be absorbed without seriously disturbing our commerce.

It would seem hardly necessary to develop any argument to the effect that practically all foreign trade settlements are made ultimately in the form of goods or services and that the major portion of the payments is made in actual goods. We already hold more than a convenient share of the world's gold. The movements of gold will be mostly outward in the next few years. Debt payments and payment for our current exports must be made in the form of services, such as ocean transportation, or else in the form of goods. The shipment of goods may be deferred in which case a temporary settlement is made by means of credit. Such transactions, however, mean future payment in goods or services and the amount of such payment is increased by the addition of interest to the principal. This is what happens when international investments are made or international loans floated.

The European debts, public and private, potentially due the United States are estimated to reach a very large amount. There is no chance that these debts will be paid in large lump sums. The terms of payment of the British debt of \$4,600,000,000 have been definitely arranged.⁵⁴ These terms call for payments reaching over a long term of years to cover interest and payments on principal. No definite arrangements have been made for the other important national debts. The financial state of the debtors renders it certain that there will be no immediate large payments. Payment may or may not be made eventually, but assuredly any payments that may be arranged for in the near

future will be modest. There is no certain knowledge regarding the private debts, but we are led to believe that the major portion of these has either been paid in full, paid in depreciated currency, or written off as "bad debts."

The terms officially arranged for the British debt call for annual payments amounting approximately to \$160,000,000 for the first ten years, and \$180,000,000 to \$185,000,000 thereafter. There seems little chance of getting the other debtor nations to swell this sum for the immediate future. These figures by themselves are large; but their influence on our economic life, however, is not their absolute size but their relation to the amount of our foreign trade. In 1923 the total value of our imports was \$3,791,938,013 and of our exports \$4,091,151,669.⁶ The figures in the British debt payments look, and are, small in comparison with such totals. They are also very small in comparison with our total national income of approximately \$60,000,000,000. The debt payments can readily be absorbed into our national consumption, especially since our national productivity is estimated to increase in quantity about $3\frac{1}{2}$ per cent a year on the average. On this basis the payment of the debt would absorb a little less than 10 per cent of the normal increase in our national productivity for one year. This is trivial compared with the fluctuations which appear in our economic activity from time to time with changes in weather conditions or the business cycle. The debt payments can be absorbed without making their effect particularly noticeable.

A greater effect may perhaps come from the further developments of the factors which make up our annual balance of trade. The present indications are that for the next few years our

⁵⁴ *Commerce Yearbook*, 1922, p. 448.

⁶ See p. 131.

investments in, or loans to, Europe will offset the payments on debts. Temporarily, our exports will probably continue to exceed our imports. The longer this is kept up either as an investment policy or as the result of trade restrictions on imports, the greater will be the necessity later either to accept large imports or to reduce our exports. That may be a cause for future anxiety; for the present the extension of credit will probably obliterate even the small influence of debt payments.

It also is of interest in this connection to note that our

agricultural exports constitute the most valuable group among all the domestic exports from the United States and, on the average, form more than one-half the value of the total domestic products leaving the country.¹¹

In such a case a material portion of whatever effect of debt payments or credit extensions there may be on our whole commerce will appear in our trade in farm products.

FOREIGN EXCHANGE AND INFLUENCES OF INFLATION

The influence of foreign exchange for some years will probably be greater than that of actual debt payments. Here again there is danger of jumping at conclusions too rapidly. The foreign exchange rate on any country is due to several factors. To the extent to which it is due to monetary inflation in that country and the effect of that inflation has been thoroughly reflected in its prices, the influence of exchange is negligible. To a large extent European prices have risen to offset exchange rates. The price levels of England were almost the same as ours last July when converted to the gold basis.¹²

¹¹ See p. 132.

¹² Federal Reserve Bulletin, October, 1924, p. 807.

Trading with that country should not be impaired by the exchange rate with the United States. Continental exchanges as a rule, however, and prices have not fully kept pace. French prices in gold were at 117 in July as compared with our 156.¹³ This constituted a real handicap to trade, but not so great a barrier as would be indicated by the exchange rate alone.

The greatest influence of foreign exchange on our export market for farm products comes from the position in which we find ourselves as compared with the position of our competitors in the same market. Here again we need to know not only the exchange rate, but the price level as well, or the price level in terms of gold values. Canadian exchange is at about the same level as ours, but Canadian prices in gold were at 149 when ours were at 158.¹⁴ It would appear that so long as that state of affairs continued, Canada would have an advantage over us in competitive trade. Any country that competes with us in the sale of farm products and has materially lower prices for those products than our prices, by reason of either the exchange rate or the domestic price level, has the advantage over us in making sales. Since most of our competitors do have such an advantage over us, one reason for our present balance of trade in agricultural products is apparent.

It is impossible to outline such conditions for all our competitors, but the case with Argentina is striking and illustrates the general situation. Argentine exchange stood at 83.42 per cent of par in the third week of last September.¹⁵ Prices in that country, instead of being higher than ours to offset the smaller purchasing power of their money, are comparatively lower than ours. Cattle prices in Buenos

¹³ Federal Reserve Bulletin, October, 1924, p. 830.

Ayres for 1923 were only 90 per cent of the 1913 price in pesos.⁸⁰ As a consequence, our prices for export beef would have had to be down to 75 per cent of prewar to compete with that country even as poorly as we did in 1913. Moreover, the general retail price level in that country is also low. This index was 136 in pesos or 113 in gold.⁸⁰ This low level of general prices affects the cost of production of cattle and all other agricultural products.

A thorough discussion of the reasons for a higher price level in gold in the United States than in competing producing countries would require much space. It is possible that our present possession of the lion's share of the world's gold is one great reason for this situation. An examination of the balance of trade figures since the outbreak of war for these other countries might also show the influence of a cumulative "unfavorable" balance tending to depress their rate of exchange. High tariffs discouraging imports into the United States may also have an effect upon the comparative situation.

How long such exchange and price conditions will last it is difficult to determine. They are gradually correcting themselves and will probably soon be less influential. Meanwhile, our export sales are made in the face of strong competition.

THE EFFECT OF THE FOREIGN SITUATION UPON FARM PRICES IN THE UNITED STATES

It is more than a coincidence that the average price of farm products in the United States has been below the general domestic price level, while the effective purchasing capacity of our chief foreign markets is low. Our agriculture produces a surplus of many

products beyond the present normal requirements. The tendency always in price-making is for the weakest market necessary to consume the whole supply to be the determining factor. If we have a surplus beyond the requirements of the home market, the price will be set in the outside markets. Only monopolies which can maintain a two-price system can escape this rule. The present ability of Europe to pay through the products of their factories and their commercial activities has an enormous influence upon our prices for farm products. It is worthy of note that the purchasing power of farm products was greatly depressed when the "paying power" of Europe was the lowest and that the two are recovering together.⁸⁷

It is not so evident why the prices for cotton and wheat, which are being exported heavily, are comparatively better than for beef, which is exported but little. The effect of European depression shows up most plainly on the average of all farm products, since farming is more or less of an integrated business in which many substitutions of one crop for another are possible. The effect on any individual crop is varied by particular conditions. A study of our beef situation indicates that we would have a surplus for export if the domestic price were as much above prewar levels as are prices in general. Fundamentally we have an exportable surplus, but foreign competition chokes the export flow and necessitates domestic sale at low price. In such a case the influence of foreign conditions is certain to appear. In the case of dairy products the price level is not depressed so greatly because

⁸⁷ McFall, R. J.: The Balance Between Agriculture and Industry, *The Annalist*, November 7, 1921. Economic Studies; *Business Conditions*, No. 10, July, 7, 1923.

⁸⁰ See p. 148.

our own production is smaller in comparison with the domestic demand. Wheat and cotton prices are high on account of world shortages. A world shortage of any product will send prices high at any time. Shortages come and go, and cannot be depended upon to increase farm prices normally. Products which we do not produce in excess of our normal national needs may be less depressed in price than exportable products, especially behind a tariff wall. The only hope, however, of maintaining a flourishing export business is, through efficient production, to cut down our costs and sell high quality goods at competitive prices.

CONCLUSIONS

The general trend of our foreign trade in farm products shows that, temporarily at least, the nation is facing a situation where the imports of food and other farm products are greater in value than the exports.

The shipment of some of our formerly important exports has already virtually disappeared and that of certain other products threatens to be engulfed in foreign competition. The beef export appears already to be a thing of the past and grain exports, excepting rice, are seriously threatened.

The demand for cotton, pork and animal fats is particularly strong and we can probably maintain our hold on these markets if we maintain our quantity and quality and sell at prices that will not be too tempting to a relatively inactive foreign competition in the production of these products.

The foreign demand for fruits, tobacco, dairy and poultry products and manufactured farm products is subject to an intermediate degree of competition. Developments in this quarter are particularly dependent upon our

ability to sell in a competition that is keen but possible to meet. Quality, salesmanship and price will determine the comparative degree to which such products are sold.

At the present our chief market, which is Western Europe, has plenty of need for our farm products, which is one factor in demand. She is weak in the other factor in demand, which is ability to pay. Consequently, she must buy at low prices.

The influence of foreign debts is small and likely for a few years to be outweighed by the influence of extension of credits and other foreign investments. The influence of a policy of restriction of imports, however, may eventually hamper our export of agricultural products.

The general situation as regards foreign prices and rates of exchange is at present highly unfavorable to our export of farm products. This situation is improving.

Europe might conceivably produce a much larger share of her agricultural requirements, but to do so she must revise her economic policy and specialize less upon exporting industrial goods to outside countries. There is no immediate prospect for such a change of policy.

When all is said, however, on these other subjects, the fact remains that the degree to which agriculture shares in our exports depends largely upon our own internal economy. Some will say that our tariff policy will affect the comparative place of farm products in our export trade. The finally determining matter, however, will be the relative economy and efficiency in our own production of farm goods and industrial goods. We shall continue a heavy export of something. International competition will force us to ship the goods which we produce most eco-

nomically. Our natural resources for agriculture are excellent and not as nearly exhausted as some think. Our industrial resources are also excellent. Which line of production will develop best depends largely on the comparative efficiency developed in these two fields. If the farmers look to boosted

prices for profits they must lose their foreign market. If they seek and find lower costs of production and specialize on producing what the best markets want, there is no reason why we should not maintain a certain amount of export trade in farm products.

A Domestic Market for American Farm Products

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THE gravity of the depression suffered by American agriculture from 1920 to 1924 is so well established by known facts that it can no longer be concealed by the well-meant efforts of some to compel an over-optimistic view or the deliberate attempts of others to disguise as much as possible the magnitude of the farmers' difficulties. During the present year, a considerable amount of partial relief has been afforded by the occurrence of poor crops in other countries, as well as by certain adjustments in our own farming economy, but it is by no means clear that the depression is ended.

The depression called attention to certain disadvantages involved in the fact that some of our great staples are on an export basis, disadvantages that consist especially in the difficulty of controlling the level of value of agricultural products by the conventional method that may be resorted to by other industries—namely, the imposition or modification of import duties. Consequently, there has been some tendency to anticipate a time when our agriculture may be largely devoted to production for the domestic market. What is the outlook for achieving this condition and what are its implications for the welfare of the American farmer and of the nation as a whole? These questions are important irrespective of whether the great depression through which we have been passing shall persist or shall prove to have run its course.

It is desirable at the outset to take stock of our present position in regard to the external market and sources of supply. This need be only a bird's-eye view, for the writer has discussed the

subject in considerable detail in a previous number of *The Annals*, and the situation has been presented in even greater detail in other more recent publications.¹

CAUSES OF EXPORT DECLINE

The rapid expansion in the volume of our agricultural exports reached a peak about 1897-98. Thereafter there was a rapid decline which continued until approximately the outbreak of the World War. This decline consisted mainly in bread grains and livestock and livestock products. The proximate explanation is not far to seek; for the per capita acreage of wheat was decreasing with great rapidity and that of corn somewhat less rapidly. The change during approximately the first decade of the present century was quite remarkable. The five-year average per capita acreage of harvested wheat centered on the year 1909 was only three-fourths as large as it had been for the corresponding period a decade earlier, while for corn it was less than 90 per cent as large. On the other hand, the per capita acreage of cotton increased slightly during the decade, and in spite of the expanding depredations of the boll weevil, the trend of cotton exports was slowly upward until about the outbreak of the World War, but not rapid enough to offset the decrease in exports of grain and livestock products.

¹ *The Annals*, March, 1924. See also articles "The Utilization of Our Lands for Crops, Pasture, and Forests" and "The Wheat Situation" in *Yearbook of the U. S. Department of Agriculture*, 1923; Nourse, Edwin G., *American Agriculture and the European Market*, New York, 1924.

The fundamental causes of this general trend were numerous and complicated and would require much space for analysis. Briefly, the change in general trend reflected the rapid increase of our consuming population in cities as compared with our population engaged in farming, which resulted in a more rapid increase in the domestic price levels of our principal exported food products than occurred in the price levels of the same products in the European consuming markets.²

This tendency, however, probably reflects a more significant fact, namely, the disappearance of our reserve of easily cultivable land of good quality and the great shrinkage in the per capita area of pasture. The first factor was largely qualitative, the second quantitative. Of land physically capable of cultivation we have upwards of 600 million acres not yet under the plow, an amount nearly double the estimated crop acreage of 1920, but practically all of it is characterized by important disabilities of one kind or another—poverty of soil, excessive aridity or moisture, necessity of clearing of stumps, brush or stones, remoteness from market.

Through encroachment of crop utilization and increase of population, it has been estimated that the per capita area of pasture was reduced by approximately 50 per cent in the three decades preceding 1920.³

In the period from 1900 to the outbreak of the World War the expansion of the grain producing area was largely into the semi-arid lands of the Great Plains and inter-mountain plateaus, where uncertainty of rainfall and high cost of transportation

tended to raise the marginal supply price.

The abnormal demand of the World War period completely reversed the tendency which characterized the decade and a half preceding the great struggle. A large expansion of the area devoted to the bread grains and some contraction in the per capita disappearance in this country made possible a large increase in exports of wheat and rye. An unusual succession of good corn crops resulted in a considerable increase in the exportable surplus of hog products. On the other hand, the depredations of the boll weevil, the migration of negro laborers to northern factories, the cutting off of Central European markets, and the increased demand for cotton in home consumption were factors which resulted in a decrease during the war period in the volume of cotton exports, a tendency which has not been reversed during the post-war period. The exports of cotton for the past five years have been less than 70 per cent of the amount for the five years 1909-14.

REACTIONS FROM MARKET COLLAPSE

It is not necessary to describe in detail the great change which followed the collapse of the price level of agricultural products in 1920 and 1921, but it is worth while to sketch briefly the reactions of this great change on our agricultural production and export trade.

The wheat area, which averaged for 1919-22 about 18 million acres above the average for 1909-13, had been increased largely at the expense of pasture and to some extent at the expense of corn and other crops, but also by the extension of the farming area in the Great Plains region. During the past three years there has been a slow but steady decrease in the acreage of wheat and rye, a decrease the slowness of

² Cf. Nourse, Edwin G., *American Agriculture and the European Market*, pp. 296-303.

³ For fuller details see "The Utilization of Our Lands for Crops, Pasture and Forests," Yearbook of U. S. Department of Agriculture, 1923.

which illustrates the economic inertia that prevents a quick readjustment of farm acreage to the demands of a declining market. However, the readjustment, though tardy, is already considerable. The preliminary estimate of the wheat acreage harvested in 1924 is only $12\frac{1}{2}$ per cent above the average for the five years preceding the World War. In fact, on a per capita basis the estimated wheat acreage of 1924 is slightly less than that for the five-year period preceding the World War.

READJUSTMENT PERIOD

The volume of export of wheat has also decreased rapidly in the period of readjustment. For the seven years 1914-20 our net exports of wheat and flour were equivalent to an average of 255 million bushels. Our exports last year had decreased to 156 million. But, on the basis of the average yields of 1914-20 and the average annual per capita disappearance for food and feed, and allowing for seed, the acreage of 1924 would provide an export surplus of only 118 million bushels a year, which is only about 15 million bushels more than the average exports for 1909-13. Approximately the reduction of another million acres of wheat area will bring us back to the same basis which prevailed before the World War.

Of course, the reduced acreage of 1924 was largely in response to the very discouraging price level of 1923. It is conceivable that the prices of the present year may stimulate some increase of wheat acreage. Nevertheless, it appears that on an acreage basis we are not far from the prewar status. Indeed, if there had not been some reduction since the prewar period in per capita requirement for feed and seed, the wheat acreage of 1924 would make possible on the average a smaller export surplus than was available in the period 1909-14.

The general tendency of rye production has been similar to that of wheat production but the readjustment has been less complete. Before the World War rye was of very minor importance as an export crop, but the exports were rapidly expanded, so that as late as 1922 exports of rye in bushels amounted to nearly one-fourth the volume of wheat exports. The acreage in 1924 was still nearly double the average of 1909-13, but the average yield per acre of the expanded area has been somewhat smaller than in the prewar period. However, on the basis of average yields and per capita disappearance, the acreage of 1924 would normally provide an export surplus of a little over 20 million bushels. This is about twenty-five times the average exports of 1909-13, but the surplus is the growth of only about one and a half million acres, so it represents a very small phase of the problem of returning to a balanced agriculture.

In relation to total area and production, direct exports of corn have never been very significant, nor was there any significant expansion either in acreage or exports during the war. Indeed, the outstanding fact is that the acreage of corn was approximately the same in 1923 as in 1910, which signifies a decrease of nearly 17 per cent in per capita acreage. An unbroken succession of years from 1919 to 1923, when the yield was above the ten-year average of 1909-18, furnished a surplus for the five years which exceeded by nearly one and a half billion bushels the quantity of corn produced in the five years 1909-13, although the average acreage in the later period was actually less than in the earlier one.

This tremendous corn surplus, together with the great reduction in Europe's purchasing power which was an important cause of the depression, made corn so cheap that a considerable

expansion in the volume of direct exports occurred in 1921 and 1922, a condition which was largely terminated by the higher prices which resulted from the unfavorable outlook for the crop of 1924.

However, the enormous expansion in corn surplus took the form mainly of a large increase of hog production and of the export of hog products. Even before these circumstances arose, pork and lard were important items in our export trade, the only remaining kind of livestock products that continued to hold an important place in our exports. It is estimated that the exports of pork and lard in 1919 represented the product of 15 per cent of our total pork production. The product of 1923 was 27 per cent larger than in 1919 and the exports 30 per cent greater.

However, the short crop of 1924 has greatly increased the price of corn, and consequently the export demand. The hog surplus is being rapidly diminished not only by rapid marketing for slaughter but also by reduction in the number of pigs farrowed and in the number of stock hogs. In short, the war produced no over-expansion in the corn and hog industry. The apparently excessive surplus was largely the result of an unusual combination of fortunate seasons. Per capita acreage of corn and even the per capita number of hogs are lower than they were a decade and a half ago.

Tobacco is another product which occupies a place of considerable importance in our export trade, though of much less importance in terms of acreage and general significance than the products previously considered. There was a steady increase in acreage and production of tobacco from 1914 to 1920, followed by a considerable reduction in the first years of depression, but in 1923 a return nearly to the acreage of 1920. There was a further reduc-

tion in the current year, so that the estimated per capita area in 1924 was about 17 per cent larger than the average for 1909-13. However, the entire acreage in tobacco is only about a half of one per cent of our total crop area.

We have now considered briefly the extent of the export surplus for products which represented nearly 85 per cent in value of our total agricultural exports in 1923, and a much larger proportion of our products which are really on a net export basis. In fact, the products which have been considered comprise practically all that are of great importance in discussing the question of a domestic market for farm products.

CAN THE UNITED STATES REACH A DOMESTIC BASIS?

The above survey has shown that we have nearly achieved the prewar relationship between exports and production. Whatever abnormal expansion the war occasioned has been nearly eliminated by the silent processes of readjustment.

However, in the years just preceding the World War we still had a considerable export surplus. In ordinary years we were then able to sell this surplus at prices which, as compared with the depression period, were relatively satisfactory. In other words, our export surplus in the prewar years was not an abnormal surplus in the sense that the surplus, say, of 1921-22 was abnormal.

However, even if we are back or nearly back to the export basis of 1909-13, it does not follow that this surplus may not prove excessive under the changed conditions of supply and demand which have resulted from the war. It is known that Europe has been reduced to a greater measure of self-sufficiency for food products, and that in all the large consuming countries, including

our own, the war induced important economies in per capita consumption through closer milling, modifications in diet, and other adjustments. Although Russia and some of the countries of Southeastern Europe no longer contribute as formerly to the export acreage of the bread grains, yet there was an enormous expansion of wheat acreage in Canada, the Argentine and Australia, so that on the basis of countries for which comparable statistics are available the world's wheat acreage was about 12.5 per cent larger in 1923-24 than the average for 1909-13. The world acreage of rye, however, does not appear to have materially changed. There is also a probability that Russia and the grain-producing regions of Southeastern Europe may become larger factors in the export market. It is also recognized that Canada has a large potential area of virgin land capable of use for small grain.

POSSIBILITIES OF EXPANSION

Even in our own country we have large possibilities of expansion in grain production when the value level shall justify the cost involved. It will be recalled that in 1919 our harvested wheat acreage was over 40 per cent greater than for the year 1924. In this country, as well as in Canada and Australia, there is a large potential grain-producing area consisting of semi-arid lands where, on account of irregularity of rainfall or uncertainty as to frost, grain production is hazardous but entirely practicable when the value level is high enough to justify the risks involved. In fact, by utilizing inferior lands and intensifying production it would be possible to produce in the United States the entire present wheat supply of the world.

In short, the course of our export trade in the bread grains depends

mainly on (1) the effective demand in importing countries, and (2) the relation of marginal supply prices in the United States to the marginal supply prices of its principal competitors. In view of the large number of unknown circumstances affecting these conditions, it is only possible to suggest some of the considerations which may indicate the balance of probabilities.

Demand is conditioned by consumption requirements and ability to purchase and is, of course, inversely affected by the price level itself. The first question, then, is as to the increase of world population and the bearing of this increase on requirements for consumption of wheat and rye. Fortunately, the countries which rely mainly on these grains for bread are those which have fairly good population statistics or reliable estimates, for, while it has been estimated that the population of the world is increasing at the rate of approximately 20 million per annum,⁴ a considerable proportion of this increase consists of people who are not consumers of wheat and rye.

Excluding Russia, all of Asia except Japan, and a few minor countries for which comparable statistics are not available, it appears that the world's wheat-eating population increased at an average rate of a little more than 6 million per annum from 1909-13. A calculation of average per capita disappearance of wheat and rye for the several countries indicates that about 25 million bushels of wheat and 7.3 million bushels of rye would be required to provide for such an increase of population. This suggests at least the probable volume of expansion in requirements of wheat and rye that is

⁴Tylor, W. Russell: *The National Increase of Contemporary Peoples*. An unpublished doctoral dissertation prepared at the University of Wisconsin.

likely to prevail as population growth returns to an approximate normal status. For wheat at least there is also a considerable unsatisfied consuming power due to inadequate ability to purchase. With improvement in economic and political conditions this potential increase in consuming power on the part of existing populations would probably be reflected in a considerable increase of demand.

FROM DEBTOR TO CREDITOR NATION

Some promise of improvement in the general financial condition of the Central European countries has become apparent as a result of recent political developments. However, there has been considerable progress since 1914 in these countries toward a greater self-sufficiency and also in the way of economies in milling and consumption. Furthermore, American exports are hampered by the remarkable reversal in credit balance whereby, from being a debtor nation to the extent of a net balance of about five billion dollars, we have become a creditor nation with a net balance of approximately 15 billion, though much of this latter consists of unfunded obligations not yet bearing interest. It has been estimated that for 1923 interest on private debts due this country plus interest on the British debt to this country will nearly equal the invisible items in our balance of accounts with Europe. Should France or other European countries begin paying interest to this country this would still further increase the balance of payments due this country.⁵

It is clear, then, that since 1914 there has been a net change in favor of this country of several hundred

million dollars of annual interest payments. This can be offset by additional borrowing for a time, which merely postpones and ultimately increases the payment of interest to this country; or it must be offset by increased exports or services furnished by foreign countries to this country or by diminished purchases by foreign countries in this country. Increased exports of manufactured products to this country are hindered by our high tariff barriers. We have also somewhat restricted services in the form of shipping charges through the maintenance of a subsidized merchant marine, but there has been a marked increase in American tourists' expenditures in foreign countries.

The fundamental scarcity in world capital which resulted from the war and which is much more manifest in Europe and other foreign countries than in the United States⁶ appears likely for some years to stimulate loans by this country abroad, a policy that will be facilitated if greater political stability shall be achieved in Europe and the Orient. It would not be surprising if investment of capital by this country abroad should continue an important characteristic of our national economy for a considerable number of years. In this case, the unfavorable reaction of the balance of payments on our export trade may be postponed until a more remote period.

Whatever may occur in this regard, the existing poverty of Europe, and for that matter, of other sections of the world, is likely to restrict buying to fundamentals. Since Europe must meet its obligations to America to some extent by exporting manufactured products either to this country

⁵ See article "The Economic Future of Our Agriculture," by C. L. Holmes, *Journal of Political Economy*, Oct. 1924.

⁶ See "Cheap Money, Gold, and Federal Reserve Bank Policy," by Benjamin M. Anderson, Jr., *Chase Economic Bulletin*, IV, No. 3.

or indirectly through triangular trade via South America or the Orient, it appears probable that raw materials such as cotton will be in demand at all costs; but, on the other hand, there is likely to be a tendency to economize as much as possible in commodities for direct consumption in Europe, such as grain and hog products.

Another element in the outlook which is hard to gauge is the probable effect of the unprecedented accumulation of gold in this country. If this should tend to raise the level of gold prices in this country as compared with Europe, a tendency which has been predicted by some economists, our export trade of farm products would probably be seriously affected.

The above brief review of foreign demand factors contains many "ifs," but taken as a whole they do not suggest a greatly increased effective demand for our agricultural exports in the next few years with the probable exception of cotton.

THE EXPORT OUTLOOK

On the supply side it would appear that even a somewhat increased foreign demand would be more probably met by increased production in Canada and possibly the Argentine and Australia. This conclusion would seem to rest on the following facts: Under the general level of value for bread grains and meat products which prevailed from 1900 to 1914 our exports of these products were steadily decreasing. The lowered value levels which prevailed during the recent depression also resulted in a gradual shrinkage of our acreage and exports of the bread grains. In the same period, however, our neighbor, Canada, increased her acreage nearly 25 per cent in spite of the low level of prices. This would appear to confirm the conclusion supported by the somewhat meager known facts as to the

character of the potential crop acreage in Canada, as well as by the information on comparative production, transportation and marketing costs; namely, that the Canadian wheat industry is at present capable of expanding at somewhat lower marginal supply prices than are requisite to stimulate the expansion of the bread grain acreage in the United States.⁷

The remarkable rigidity of the corn acreage, even under the potent stimulus of war prices, and the resulting large decrease in per capita acreage of corn mentioned above, suggest that under ordinary levels of value for corn and hog products we are not likely to have a marked expansion of these industries.

In fact, it is most significant that our per capita acreage of all crop land was less at each census period after 1900 and has continued to decrease since 1920. The expanded acreage of wheat, rye and tobacco in the war period were made possible partly by shifts in the utilization of the per capita area and partly by the reduction of the per capita acreage employed in feeding livestock.⁸

If our productive acreage continues to manifest the continued resistance to expansion which the above facts suggest, it appears reasonable to suppose that our export surplus of grain and hog products will tend to shrink for some years on account of the necessity of devoting the surplus to meet the needs of our rapidly increasing population. If there were no expansion at all in our crop area, the normal export surplus of wheat available from the acreage of 1924 less our normal imports would be sufficient to

⁷ See article "The Wheat Situation," *Yearbook for 1923*, U. S. Department of Agriculture.

⁸ See "The Utilization of Our Land for Crops, Pasture and Forests," *Yearbook for 1923*, U. S. Department of Agriculture, pp. 433-443, 446-449.

maintain a population increase of about 17 per cent, the increase of about the same number of years at present rates. The assumption of no increase in total crop acreage, some of which would be employed for wheat, is of course quite improbable. However, such an increase is likely to be offset to a considerable extent by the tendency to divert some of our surplus wheat acreage to meet the increasing requirements of other farm products. All in all, it seems improbable that our wheat industry will be on a regular deficit basis before a period of from one to two decades has elapsed.

Our relative surplus of hog products is much smaller, and as already noted, is much more abnormal than the wheat acreage of 1924. However, a rapid process of readjustment is under way. The June survey of the U. S. Department of Agriculture indicated decreases as compared with the previous year of 21 per cent in number of hogs farrowing, 20 per cent in number of pigs saved last spring, 6 per cent in number of sows bred or to be bred to farrow this fall, and 10 to 15 per cent in the number of fall pigs.

Hog production in this country is largely dependent on corn. There is a tendency, of course, to substitute in part forage crops, roots and other more intensive crops, but corn is still the important basis. It has already been noted that the per capita acreage of corn decreased 17 per cent from 1910 to 1923. Moreover, although in the past decade and a half there has been a notable decrease in per capita consumption of beef, the per capita consumption of pork and lard has not decreased. The experience of Germany suggests a tendency toward maintaining a comparatively large per capita consumption of hog products when population is dense, and it seems probable that we shall not have a

marked decrease in per capita consumption of hog products. Consequently, one would expect that our domestic requirement for corn to provide our increasing population with hog products and dairy products will rapidly absorb the comparatively small percentages of exports of corn and hog products.

The outlook for cotton exports is on an entirely different basis. In the first place, even when scarcity of land becomes more evident in our national economy than at present, it is entirely possible that we may continue to devote a large area to producing cotton for export, though compelled to rely on imports of other agricultural products in order to spare the land for this purpose. An important consideration in this regard is the fact that cotton is essentially an intensive crop, requiring a comparatively small land area in proportion to value of product. The same consideration makes quality of land relatively less important than in the case of grain, for it facilitates the employment of comparatively light, sandy soils with the aid of fertilizers. There are enormous areas of such lands still in reserve in the southern states. Moreover, recent events seem to indicate a large potential expansion in the semi-arid lands of the Southwest.

The depredations of the boll weevil, which have been mainly responsible for decreasing the average yield of cotton nearly 20 per cent in the past quarter of a century, the rising level of wages in the South, and the necessity of resorting to fertilizers in the expansion of the industry have raised the marginal supply price of cotton. This may create a more favorable opportunity for the large extension of the area in foreign countries. However, one is inclined to be somewhat skeptical as to this becoming a large factor in the outlook. Since a decade or

more before the Civil War the bogey of foreign competition has been raised. However, though India, Egypt and the South American countries have become large producers since that period, the process of expansion has been too gradual to menace seriously the preponderance of the southern states in the cotton industry.

These considerations do not point toward the probability that this nation will cease to produce cotton for export during the next decade and a half or even longer; and the same general conclusion would seem to be justified in the case of tobacco, and for somewhat the same reasons.

In brief, then, the probability that we shall attain the purely domestic basis of production in a comparatively few years seems strongest for corn and hog products; it also exists in the case of the bread grains, but perhaps not for another decade at least. It seems likely that we shall continue to export cotton and tobacco for a much longer period. With the exception of these products, our agriculture is already mainly on the basis of the domestic market or the domestic market supplemented by imports; and measured by value our agricultural exports and imports are already not far from a general balance.

INFLUENCE OF A HOME MARKET ON THE FARMER

One sometimes hears it said that if we were on an import, rather than on an export, basis of production for a particular product, say, wheat, the farmer would benefit by the freight charges both going and coming. For instance, since the freight charge per bushel of wheat from Minneapolis to Liverpool via New York was 25.6 cents in the fall of 1923, it is assumed that the farmer in the neighborhood of Minneapolis loses this much plus the

other marketing charges by having an export surplus to dispose of, and that if America were on a net import basis, the farm price near Minneapolis would be increased not only by the cost of shipping to Liverpool but also by the additional cost of bringing wheat from Liverpool to the United States.

To attempt to criticise so naive a concept may appear like directing one's batteries against a straw man. However, the conception may afford a useful starting point for analyzing the influence of production for the export market on the economic position of the farmer.

The first and most obvious point is that while we have been selling our surplus in Europe, we would probably buy for import nearer home. In fact, we are already generally on a deficit basis for hard spring wheat and have been importing considerable quantities at times in spite of the barrier of tariff and transportation costs. In short, Canada would probably be the main reliance for supplementing our bread basket, and the cost of transportation from Canada rather than from Liverpool the significant item.

However, assuming this nation were self-sufficient in wheat production, neither importing nor exporting farm products, and it became necessary to rely on importation, it would not follow that the value of wheat would have to be higher by the amount of the cost of transportation from Canada to the United States. If the Canadian producers had been previously compelled to market their wheat to Europe, and suddenly found it possible to sell a considerable part of the supply in the United States, the relative competition would give the American consumers the advantage of their greater nearness to the grain fields. To illustrate, if Canadians

could afford to sell wheat in Liverpool at \$1.38 when freight and marketing charges amount to 30 cents a bushel, and if it became possible to sell in New York by paying a transportation charge of 21 cents, the Canadian farmer could then afford to sell his wheat at \$1.29 in New York. Now if the marginal supply price in the United States had been 12 cents higher than the Canadian, the necessity of importing Canadian grain, assuming no tariff, would raise the price level only by 9 cents rather than by 21 cents.

In short, it is clear that relative marginal supply prices are likely to be determining factors. The differential between Liverpool and North Dakota could not be added to the price received by the farmer in the latter state unless his supply price were correspondingly increased, for

competition would ultimately force the level of market prices in this country to the level of marginal supply price. The latter may increase slowly in this country as we are forced to expand our production to meet our requirements, but if the change comes slowly the increase will be capitalized in real estate values, and will, therefore, not be of benefit to the new generation of farmers.

There may be some advantage in being able to correct abnormal dislocations of the price by a sliding-scale tariff, administrative readjustments in rates, or some other similar device.

There are also broader considerations from the standpoint of national interest and welfare, as distinguished from the profits of farmers, which cannot be discussed within the scope of the present paper.

The American Farmer and the Tariff

By CHARLES W. HOLMAN

Secretary, The National Co-operative Milk Producers' Federation

THIS paper will undertake to show the changed relation of the American farmer to the American tariff. It will also show the extent to which a protective tariff on agricultural products is an integral part of a national agrarian policy.

Party conflicts over the tariff are historically grounded in the economic conflict between agricultural producers and industrial producers. In the early days of the Republic the Democratic party more nearly represented the agricultural groups, while the Republican party had its roots in the industrial communities. The agricultural South, having been accustomed since Colonial days to importing its requirements, did not look with great enthusiasm to the prospect of paying higher prices for such requirements in order to permit the development of the industrial North. The industrial North, on the other hand, very quickly adopted a policy of protection for manufactured products and free trade on the raw materials needed by such manufacturers. Organized labor has usually accommodated itself to this view of the manufacturer with respect to commodities produced by organized labor. In its effort, however, to establish "real wages," it has tended to oppose duties on certain products in which its consumptive interest would be greater than its wage interest. These commodities are notably the products of the farm. For a similar reason, manufacturers, anxious that their laborers shall get "real wages" without themselves having to increase their wage bills, have usually desired free trade in agricultural products.

As the nation developed and the tariff became an accepted part of the national policy, conflicts between the urban and rural sections of the communities lessened in severity. The Democratic party changed its slogan to "A tariff for revenue only." The Republican party maintained its historic position. Tariff contests in the Congress, therefore, reduced themselves to questions that involved not so much whether there should be rates, but the nature of the rates themselves and the relation of the various items in a tariff act to each other and the effect upon the various groups of such rates.

Equitable distribution of benefits among the people, smoothing out of glaring inequalities in the bills, became the chief issues in the intervals between the passage of each succeeding tariff act. No tariff act has ever satisfied all of the people and each succeeding tariff act has tended to increase many duties.

GENERAL PREWAR AGRICULTURAL CONDITIONS

It is pertinent to inquire into the causes of the changed attitude of farmers toward tariff and their demand for protective duties on agricultural commodities. This involves a study which will only be briefly treated here—the declining curve of our agricultural exports and the rising curve of our manufactured exports. In the expanding years of our agriculture—the developing seventies, eighties and nineties—Europe afforded a market for most of our surplus farm products. Those were the expanding years of European manufacturing; those were also the years when the farm products of newer

lands, such as Argentina, Australia, New Zealand, Canada and Siberia, were not competing seriously with ours in the world trade. Those were years when our abundant crops from the virgin lands of the Mississippi Valley and the Western plateaus produced enormous export surpluses which were sold at any price to Europe's satisfaction and our discouragement.

From 1900 to 1914, however, American farm production tended to become static while domestic consumption, due to the great accession of the industrial population, tended to absorb our production. Cotton was about the only export crop which maintained the volume of its outward movement, exports of fresh beef fell down to nothing, and exports of pork products were declining. Wheat had fallen from one-half billion bushels of export of a few decades before to an average of less than one hundred million bushels. But the condition of American agriculture was sound and farmers were more generally prosperous than at any time since the beginning of the Civil War. Few people had analyzed the silent changes which were taking place in Europe's buying policies or recognized that this American farm prosperity in 1914 was largely the result of the force of domestic production and consumption being more nearly balanced. But even then there were indications that certain agricultural products from other nations would be placed upon the domestic market in competition with our own farm producers.

The World War temporarily upset this slowing down process of American agriculture which had been accompanied by quiet changes in farming programs. The impulse of high prices and government propaganda revealed an undreamt capacity of American agriculture to expand production. For a time this expansion worked to our ad-

vantage, since the war curtailed Europe's production and a shortage of shipping prevented material expansion in South America, Australasia and the new lands of the Orient.

Our expansion program continued well into 1920, and was accompanied by material rises in costs. Then came the world release of surpluses and precipitous price declines in raw commodities. American farming immediately dived from the plateau of prosperity into the slough of disaster.

LESSON OF THE DUMPING EVIL

The first task of the surplus-producing nations was to dispose of their surplus. That led to indiscriminate dumping wherever markets would absorb commodities, and the United States for a time was the most attractive dumping ground for other nations. Their money being worth little and in some cases nothing, our money looked good to them no matter what price was paid for their commodities. The rural districts were the first to feel the evil effects of dumping and a clamor arose for the government to put an end to it. Through the efforts of certain farm organizations at Washington, Congress responded to the farmers' cry for help and in the spring of 1921 passed a special emergency tariff act which gave a modicum of protection to a number of agricultural commodities. The effect of the emergency tariff act was immediately discernible. For a time it checked the dumping evil and tended to stabilize farm prices. Experience with the act, however, convinced many leaders of farm organizations that the rates in it were not high enough to be incorporated in a permanent tariff act and that many other commodities should be included.

Out of this experience there developed a settled conviction that American farmers would always in the future

take a keener interest in tariff making because of the changes which have occurred in the latter-day world. These changes include:

(1) The development of newer countries and cheaper lands producing export surpluses which must find a market irrespective of price.

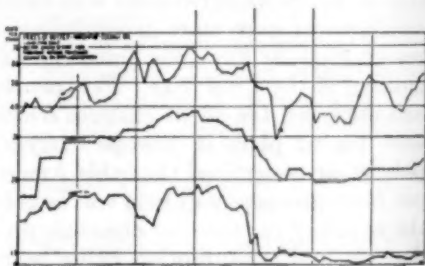
(2) Realization of discrimination against agriculture in former tariff bills. This discrimination has never been as severe as many advocates would have the public believe. For if one will examine the various tariff acts he will find that a consistent policy has been pursued of putting on the free list many of the important articles which farmers buy. There have been deviations from this policy, but in the main it has been pursued consistently by both parties.

(3) The realization by farmers of the unique position of America as an exporting nation of both raw and manufactured products. This situation complicates the problems of both farmers and manufacturers. It is a relatively simple matter for a country like England, where industry is the dominant source of revenue, to adopt trade policies that will benefit the nation as a whole. England can well afford to purchase the raw products of the colonies and of the Orient when there is a chance of selling back her manufactured articles. But the farmers of the United States are competing with the farmers of the newer countries where manufacturing has not yet developed. At the same time American manufacturers are competing with European manufacturers. In consequence our trade position is isolated and there is bound to ensue a struggle between American farmers and American exporters on any question where international trade possibilities are involved. This finds expression in conflicts over tariff legislation.

The farmer has good reason to be-

lieve that the future will witness this urban versus rural conflict grow into an even fiercer struggle. The relative increase of urban population over rural population will make it more difficult as time goes on for farmers to secure their tariff demands. A tariff on agricultural products is an integral part of a national policy for the perpetuating of a self-sufficing farm population.

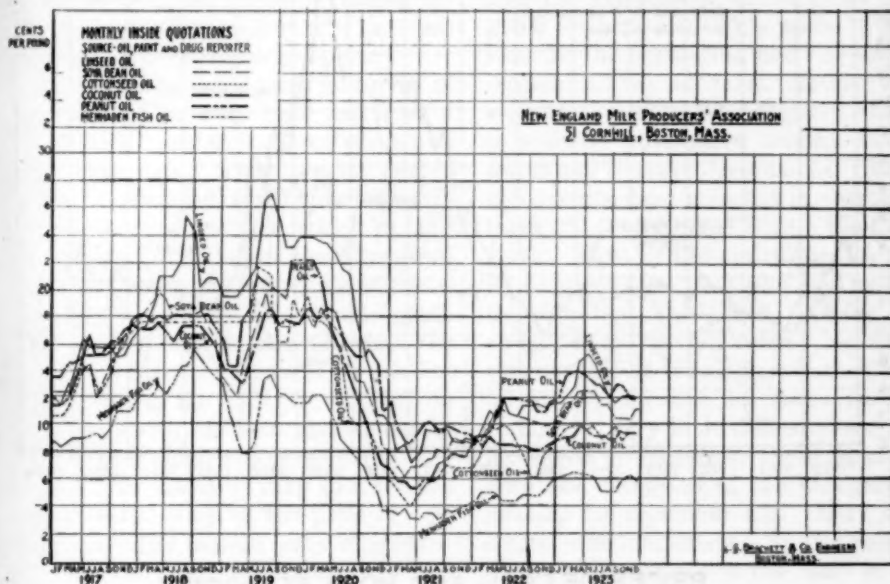
(4) The ability of science to substitute one article for another in the manufacture of products. This has produced a new form of competition which is best illustrated in the case of the fat supply. American farmers produce certain vegetable oil materials, the most important of which are cottonseed, flaxseed, peanut and soya bean. They are also producers of all of the animal fats. American fishermen are producers of important fish oils such as the menhaden and the cod liver oils, and some fishermen bring in whale oil.



In normal times we produce annually from four billion to five billion pounds of animal, fish and vegetable fats and over 1,600,000,000 pounds of fat in butter. This alone would leave us an exportable surplus of about 700,000,000 pounds of fat, but owing to the interchangeability of oils, American manufacturers annually import about 300,000,000 pounds of fats, principally vegetable oils, which displace in industry the home produced oils and fats. That increases our exportable surplus to nearly one billion pounds.

Not only are most of these vegetable oils interchangeable among themselves but they are also interchangeable with fish and animal oils. The margarine industry, for example, uses nearly a score of different types of fats as its ingredients.

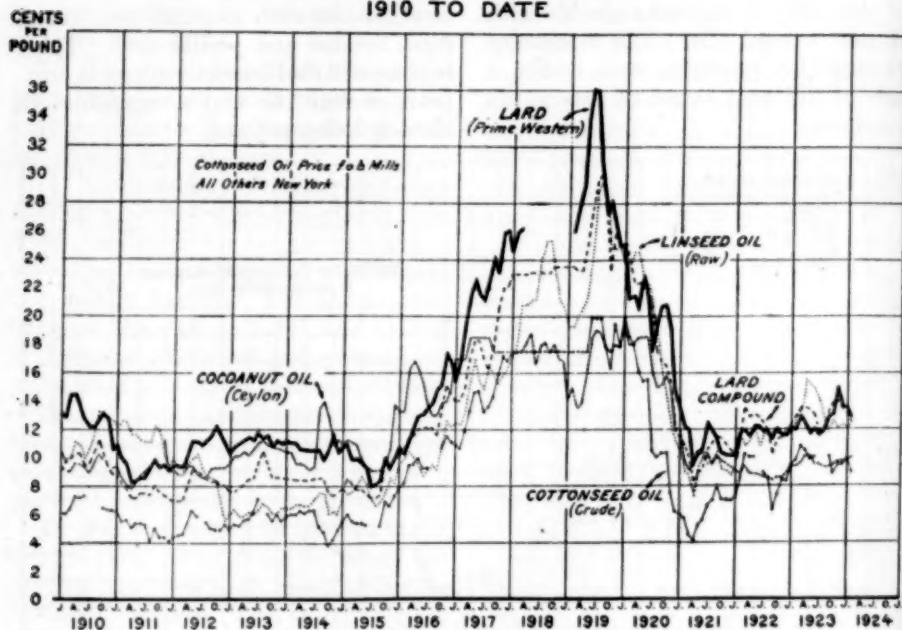
oil, and olive oil are important competitors in salad dressing. There are hosts of other oils such as sunflower, hemp, rape, sesame and perilla seed. These in time will find important uses in competition with the major vegetable oils already being utilized.



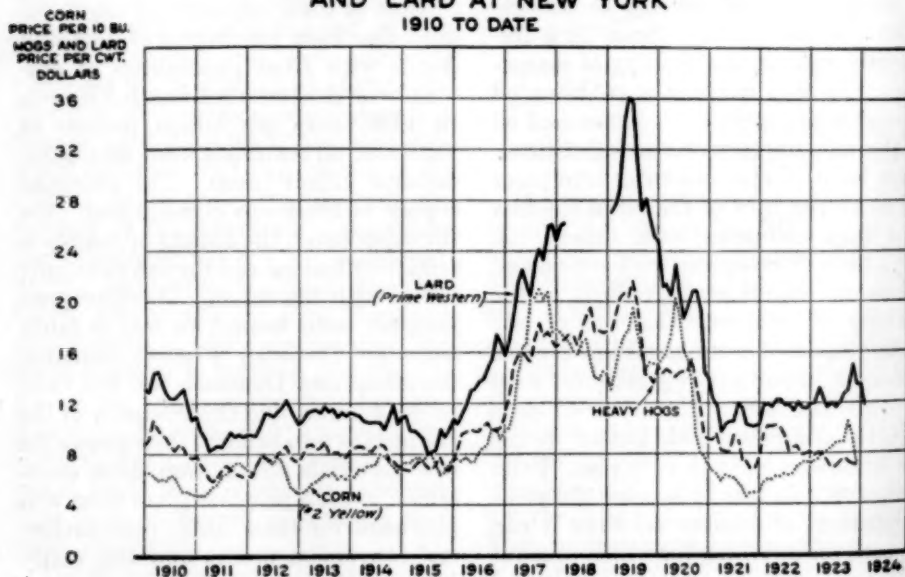
Another illustration may be serviceable. In Europe soya bean oil is frequently used in the making of margarine. In this country soya bean oil competes primarily with cottonseed oil in the manufacture of lard substitutes. Soya bean oil also can enter into paint up to 30 per cent of the oil in the mix and thus competes with linseed oil. Soya bean oil competes with cottonseed oil as an important ingredient in the making of oleomargarine, but of late years imported coconut oil has become the most important vegetable fat used in this industry. Coconut oil also directly competes with butter in the confectionery and baking trades. Palm kernel oil bids fare to become the great competitor of coconut oil since it can be used for anything for which coconut oil is now used. Peanut oil, cottonseed

Most of these competitive vegetable oils come from the tropics of Asia and Africa with great possibilities of production in Australia and South America. In 1920, over ten billion pounds of vegetable oil materials went into international export trade. The potential supply of these oils is unlimited. On the other hand, the animal oil supply is relatively limited and the fish oil supply varies with the catch. The European program with respect to fats is fairly definite. England, France, Holland, Germany and Denmark are the chief manufacturers and the tendency of the Europeans is to bring to their plants the raw materials direct from these countries. Such a program gives them employment for their labor, manufacturers' conversion profits and the cattle feeds which are by-products of most

PRICES OF VEGETABLE OILS, LARD AND LARD COMPOUND 1910 TO DATE



PRICES OF CORN AND HOGS AT CHICAGO AND LARD AT NEW YORK 1910 TO DATE



oil seeds. Japan is a large converter of oils; but the large Japanese firms which operate in these fats can easily shift their programs to exporting all raw materials should converting the oils prove to be less profitable than the other trade. This is made possible by their far-flung networks of trading organizations which collect the raw materials and bring them to ports.

Certain American manufacturers of fats would like to have the privilege of purchasing vegetable oil materials and oils duty free. That would enable them to displace large quantities of American produced oils, which in turn would be forced upon the European markets in competition with additional quantities of Orient oils already going there. The interest, therefore, of the American farmer in a tariff on oils lies in protecting his domestic market on oil seeds which has been threatened by the former huge imports from the Orient. It would be easy to trace the direct relationship of the price of cottonseed to the market price of cottonseed oil, and the relationship of the market price of cottonseed oil to the other major oils. Likewise it can be shown that there is a direct connection between the market price of coconut oil and the market price of butter and margarine.

Out of this situation we find the need of tariff protection to the producer of some commodities which already are exported in large quantities and whose prices are determined by international forces.

THE FORDNEY TARIFF BILL

The growing need for farm representation in tariff-making was reflected in the activities of certain farm organizations while the Fordney-McCumber Tariff Act of September, 1922, was in the making. By that time many farm groups were agreed upon the need of

duties being placed upon imported oils and fats. The dairy farmers had worked out a well-defined program with regard to dairy products. The wool producers and the egg and poultry men, the citrus and deciduous fruit growers had arrived at the duties they desired and the growers of cereal crops had given expressions. This made it possible for the permanent and temporary representatives of farm groups who were stationed in Washington to form a working committee among themselves and to make agreements. Those agreements were reflected in combinations which took place within the Congress. Most of the agricultural activity occurred after the House had passed the Fordney Tariff Bill. Grave inequalities in the bill caused the farm representatives to ask the Senate Committee on Finance to make needed changes. Very little difficulty was experienced in securing these changes with the exception of the paragraphs relating to vegetable oils. Here was staged a bitter contest with the Senate Finance Committee in the main being against the farmers and the Senate as a committee of the whole sustaining the position of its Finance Committee. When the matter came to final passage, however, the duties requested by the farm organizations on vegetable oils went through with the exception of the duty on copra, which largely neutralized the effectiveness of the duty on its derivative, coconut oil. This battle had many sensational features. While it was going on the oil markets of the United States reflected in a speculative way the varying fortunes of the contestants.

This tariff act gave more prominence to farm duties than any other act. It gave higher protective rates to organized industry than any other act. It also has produced more Federal revenue than any other act. Much criti-

cism has been made of the act on the grounds that the protection given agriculture is outweighed by the protection given other industries. Intricate calculations have been made to sustain such criticisms. The writer does not purpose to deal with this phase of the subject beyond pointing out that most of these calculations have been theoretical and without enough fact basis to make them trustworthy. The important thing for farmers to remember in connection with this act is that they made great headway in establishing the principle of protection for agricultural products and secured a greater equalization of benefits than came from any previous tariff act.

FATAL "FLEXIBLE TARIFF PROVISION"

But there was a "fly in the ointment." The Tariff Act of 1922 contained a section which was destined to sow discord and perpetuate strife. It was Section 315, popularly known as the "flexible tariff provision." Within five months after the passage of the act, certain industrial interests were invoking this provision in efforts to take away from farmers some of the benefits the latter had wrung out of Congress. And so the scene of conflict has shifted from the halls of Congress to the home of the U. S. Tariff Commission; and the conflict itself has become continuous, expensive and wasteful.

To understand this provision it may be well to recall the object of a tariff. The government has one viewpoint. The industry concerned has its own viewpoint. The government lays a tariff to secure revenue and bring about national economic sufficiency; but in doing so it must always consider the effect of such tariffs upon its friendly relations with other countries. The special industry seeks a tariff, usually, (1) to equalize costs of production plus a fair profit for most of the American

producers, (2) to secure domestic price stabilization by preventing seasonal dumping, and (3) sometimes to obtain exorbitant profits at the expense of the consuming public. Other reasons may govern either the government or the industry, but the problem of determining a rate is usually the result of a compromise between these views; and the compromise represents the judgment of common sense. The basic reason for one rate may be to protect against trade discrimination, another may be to develop needed industries, a third may be to prevent dumping, but no single reason can underlie the making of all of the tariff rates. It would therefore follow that no single rule can be workable in making changes in the rates which were fixed by Congress.

In making a tariff, Congress also recognizes a relationship which certain commodities have to each other and the rates on these commodities are scaled. Consequently, to change the rate on one commodity without taking into consideration its relation to some others can have very serious effects upon an industry. Notwithstanding this well-known principle in tariff making, Congress made a notable departure in the Act of 1922 by including Section 315. This departure was in part a compromise with critics who demanded that the tariff be taken out of politics. In part it was a compromise with enthusiasts who desired to have the duties laid on the basis of their wholesale market value in America instead of in the country where they were produced.

The flexible tariff provision gives the President the right to make changes in the tariff to the extent of either raising or lowering the duties by 50 per cent. It provides that the necessary facts governing a change in the duties shall be ascertained by the U. S. Tariff Commission and the President shall make his decision only after the Commission

has reported the results of its fact finding. In ascertaining its facts, the Commission is limited to a single rule, namely the differences in cost of production in the United States and in some country which the Commission may designate as the "principal country of competition." In exercising his judgment, the President is permitted slightly broader discretionary powers. The extent of these powers, however, have not been adequately determined and are hardly known to the general public. The Commission may initiate inquiries. The President may also order the Commission to initiate inquiries.

The flexible provision is of such a character that its operation is inevitably doomed to failure; for the rule by which investigations can be made is only one of the rules by which Congress determines a duty. Congress was evidently unwilling to give either the President or the Commission as broad a grant of power in rate changing as it possesses in rate making. To have done so would undoubtedly have been unconstitutional. Even the power already granted is held by some constitutional authorities to be a direct violation of the Constitution itself. Yet it must be clear to any one that the power to change, if this power is to be effective, must be as broad as the power to levy duties.

Agricultural organizations have had an unusual amount of contact with the operation of the flexible tariff provision.¹ A large amount of the Com-

¹ On December 1, 1924, about two years and two months after the passage of the flexible tariff provision, the U. S. Tariff Commission had started 40 investigations, but abandoned 8. Of the remaining 32 the commodities affected are not of great importance except those affecting agriculture: *i. e.*, butter, sugar, casein, Swiss cheese, wheat and wheat products, linseed oil, cottonseed oil, peanut oil, soya bean oil, coconut oil and fish oils. Decisions had been reached in only 3 out of the 32 cases. One of these decisions concerned wheat and wheat products. The

mission's activities during the past two years has been devoted to investigations of the fairness of rates in commodities affected with an agricultural interest. In fact so much time has been given by the Commission to studies of this character that it may be reasonable to say that the opponents of duties on raw products are seeking to utilize this new machinery to carry out their ends. So far the experience of farmers with the Commission has been sufficiently unsatisfactory to cause some important groups to ask for the repeal of the flexible tariff provision. Here are some of the reasons why they seek a return to the old practice of congressional tariff making:

The act creating the Tariff Commission conceived of a research body without quasi-judicial functions. The Tariff Commission was to make continuous studies of tariff facts and report its findings to Congress from time to time. A commission of this character could very easily do its duty on a bipartisan basis, and the law provided that not more than three members should belong to a single political party. But when the flexible tariff provision became a part of the law the Commission's functions automatically changed. While it is true that the Attorney-General has held that it is still a fact-finding body, it is also true that its methods of working resemble that of an economic court. It sits as a body in public hearings, collects facts and passes its judgments on to the President for a final decision. Under conditions of this character a bipartisan commission can hardly hope to arrive at unanimous conclusions, and its members are very likely to carry into prac-

Commission recommended and the President ordered the duty to be raised on wheat and lowered on wheat-milled feeds. The result was a lessening of spring wheat imports from Canada and an increase in imports of milled feeds.

tical operation the traditions of their respective parties with regard to conclusions. It is doubtful whether any bipartisan commission could be selected that would be unanimous. It is also doubtful whether any commission, even if it were unanimous, could apply satisfactorily the cost of production rule in making tariff changes.

The above criticism applies to the general workings of the law. The following criticisms will apply to the procedure adopted by the present Commission which has made its activities so obnoxious to agricultural producers.

WHEREIN THE COMMISSION HAS FAILED

(1) The Commission has the right to determine what is the principal country of competition.

It has established no set rule for determining this question, but has generally been guided by volume of exports. Potential competition has not been given its proper place in the Commission's consideration. This is illustrated by the Commission's investigation of the butter tariff rates. Without consulting the organized dairy interests, the Commission took upon itself the task of determining the principal country of competition and decided it to be Denmark. Now it happens that Denmark is a country which has about reached the peak of its possible exports. It is also a country which produces butter at very high costs and trusts to improved marketing machinery and the production of a high class of product to offset the disadvantage of high production costs. Denmark also has the practice of so distributing her butter exports that her principal markets will never be excessively crowded. It sometimes happens that heavy receipts in the British market from New Zealand, Argentina and Australia make it necessary for Denmark to shift a part of her butter to

other markets. Should the exchange rates be satisfactory, she will move certain cargoes to the Port of New York; but her shipments to the United States are usually only for this purpose, or when the exchange would permit a profitable movement. Argentina, New Zealand and Australia, on the other hand, are countries of very large production possibilities and their production curves have been ascending rapidly since the close of the World War. These countries have not built for themselves, as yet, the markets which the Danish people have worked up, and they are seeking to put their butter wherever there may be a demand. This situation has caused Denmark to view with some concern the competition of the southern hemisphere and to send investigators there to study production trends. The known lower costs in these countries, combined with their rapid increases in production, make them more formidable potential competitors for the American domestic market than Denmark ever can be. Yet the Commission injudiciously chose Denmark, and the results of that choice may prove detrimental and even disastrous to the American dairy farmers. If a comparison of the costs of production in Denmark and the United States should reveal only slight differences, it would be very difficult for the President to avoid lowering the butter tariff rate, even though the effect of this lowering would be greatly to accelerate the movement into the United States of butter from the southern hemisphere. It may therefore happen that a strict application of the cost of production theory will intensify the dumping evil.

(2) One theory upon which the flexible tariff provision rested was the necessity of making rapid adjustments in tariff rates to equalize changing conditions of competition.

The procedure of the Tariff Commission has not justified such expectations. Its investigations have been long drawn out and characterized by a lack of decision. Only one or two investigations have been concluded. This slowness of action clearly frustrates the design of Congress; for it may result in decisions to change rates based upon evidence taken at cut-off periods of from one to two years prior to a decision. For example, the investigation of casein began in the early spring of 1923. That investigation has not yet produced a decision. But uncertainty as to the result of the investigation was no doubt a contributing factor to the crash in market prices of casein which occurred shortly after the investigation began.

- (3) In some very important cases where the producers have maintained that the competition was between agricultural producers of competing nations, the Commission has insisted upon deciding the competition to be between the manufacturers or converters of the raw materials.

In those cases it has failed to utilize evidence of agricultural costs; it has taken manufacturers' converting costs and the prices paid by manufacturers for raw materials. The two most notable instances of this attitude have to do with the investigations of sugar and of vegetable oils. In the sugar case, however, the President recognized the justice of the American sugar planter's plea, which was sustained by most of the farm organizations and ordered the Commission to report upon farm costs. The vegetable oil cases are still pending, but it is known that the investigators are not studying the agricultural costs in these instances.

- (4) The flexible tariff provision instructs the Commission to give notice of hearings so that interested parties "shall be given an opportunity to be present, to produce evidence and to be heard."

But in its procedure, the Commission appears to consider these hearings as mere "window dressing" affairs. It sits patiently through the hearings but refuses the interested parties permission to make direct inquiries of the investigators of the Commission itself. In consequence it is often impossible to get at the fact basis of the Commission's private investigations. The Commission receives evidence from (a) witnesses at public hearings, (b) investigators employed by it, and (c) confidential evidence voluntarily furnished to it. The interested parties are not in a position to refute evidence of which they have no knowledge and hence this phase of the Commission's procedure is very unpopular with farm producers.

- (5) It is doubtful whether it has ever succeeded in getting exactly comparable cost data.

It is well known that investigations in foreign countries have been unsatisfactory and have produced very little information exactly comparable with investigations in this country. The Commission's investigators have been furnished with certain types of information, but they have rarely been given an opportunity to make really adequate checks of the accuracy of such information.

- (6) The bipartisan character of the Commission and its new responsibilities have laid it open to the just charge that the flexible tariff provision has plunged the tariff further into politics than it ever was before.

This bipartisan character results in destroying the reputation of the Commission for fair-minded, disinterested, scientific investigations. It is destroying the confidence of the public in the Commission itself.

The above criticisms, in the judgment of this writer, would be inevitably true no matter whom the President might appoint on the Tariff Commission. It is the logical result of the transference by Congress of a power which should have remained vested in Congress itself.

While the flexible tariff provision should be repealed, there remains an important function for the Commission to perform. This function is the one for which it was originally created. It should be adequately financed to carry on studies of the effects of each tariff upon the public and the industries concerned and to make its reports to Congress. But tariff-making by commission or executive order is today highly repugnant to the agricultural groups who have had experience with this unfortunate practice. As between tariff-making by Congress and tariff-changing by executive order, there is no doubt where agriculture should stand. It can adjust itself to almost any tariff; but it cannot adjust itself easily to the uncertainty which prevails under the flexible tariff provision. This uncertainty is aggravated by speculators who take advantage of the possibilities of change.

PRICE-MAKING ELEMENT IN TARIFF

One phase of this situation deserves some consideration. It is claimed that a tariff unsupported by price-making machinery can have little influence upon domestic prices of agricultural commodities when those commodities are internationally produced and subject to international trade influences. Wheat is taken as the principal illustration of this contention. It has been

held that the tariff on wheat has had little to do with the price of wheat. Undoubtedly that is true with the exception of spring wheat, but considerable evidence exists to show that the grower of spring wheat has materially benefited by the existence of a duty. Great benefits have come to the northwest from the duties on flaxseed and linseed oil and the remarkable acreage increases in flaxseed which has been marketed at a fair range of prices attest this fact.

This wheat situation, however, led to a movement to bring about government interference with market prices in such a way as to stabilize domestic prices of certain agricultural products behind a high tariff wall. This movement culminated in the attempt to pass the well-known McNary-Haugen Bill. That bill rested upon a further extension of the flexible tariff powers so that imports of commodities could be completely shut off and a governmental corporation could name a price on domestic sales which would return to farmers a ratio price slightly under the buying power of these agricultural commodities for the period 1909-13. It was then proposed that this corporation should sell the surplus products upon the world market and spread the losses on export sales among the producers by a plan which would resemble a governmentally-operated pool.

This movement fell short of attainment in the last session of Congress; but it has many strong advocates who will make another attempt to enact the McNary-Haugen Bill. It is mentioned here primarily to show the growing importance of tariff-making in the minds of American farmers. It also shows in a vivid way a groping toward forms of organization that will be effective in domestic marketing and comparable with the price-making powers of great industrial organizations.

Measuring the Spread from Farmer to Consumer

By WALTER P. HEDDEN

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IN the course of popular discussion centering around the distribution of farm products, a renewed interest in the margin or spread between farm price and retail price is manifest. The violent ups and downs of prices during the war and post-war periods appear to have drawn attention beyond the immediate prices with which the producer or consumer is concerned to the relation between them. At least, we have heard a good deal about the price of the apple on the fruit-stand compared to the price of the apple in the orchard with questions as to "what happens in the dark" and "how much of the consumer's dollar goes to the producer." There is no doubt that the spread is there, although how large is difficult to say. Still more puzzling is how to reduce it.

STUDIES IN DISTRIBUTION MARGINS

In addition to the standard formulas of tariff revision, lowering freight rates, and encouragement of co-operative marketing, there are numerous suggestions for lessening distribution margins. Many feel that physical improvements in grade and quality of produce, improvement in methods of transportation, development of temporary storage reservoirs, provision of modern and adequate terminal facilities will, through reduction in waste and handling cost, bring about a smaller spread. Others are more inclined to pin their faith in commercial reforms. They see unnecessary middlemen to be eliminated, the necessity of regulating crop distribution in accordance with the consuming capacity, a substitution of merchandising for dumping. To aid in evaluating

these suggestions and others, a technique of measurement is needed which will establish not only how large the spread between farm and retail price is, but how it is divided up under different conditions of time, place and commodity; how it varies, and with what influences it may be associated.

Through the activity of government bureaus and commissions, of universities, and of certain commercial agencies, such as the California Fruit Growers' Exchange and the National League of Commission Merchants, a number of margin studies have been made from time to time. The results of these investigations make it clear that the portion of the consumer's dollar which goes to the grower is by no means constant. According to one study, the potato growers of Wisconsin were receiving twenty-one cents out of every dollar spent for their product by the consumers of Chicago in 1923.¹ At the same time the Maine potato growers secured thirty-one cents of the Boston consumer's dollar. Over the five-year period from 1917-21 the California Fruit Growers' Exchange calculates that the grower received 39 per cent of the retail price for his oranges. In 1921 the gross return to cranberry growers was found to be fifty-four cents of every dollar spent

¹The margins quoted may be found in a mimeographed release by the Cost of Marketing Division, Bureau of Agricultural Economics, entitled: *An Analysis of the Retail Price of Potatoes Grown in Maine, Minnesota, Wisconsin and Michigan, and Sold in Boston, Chicago and Pittsburgh*, by Manning and Swarthout; and Department Bulletins No. 1261 and No. 1109, *Operating Methods and Expenses of Co-operative Citrus-Fruit Marketing Agencies and Sales Methods and Policies of a Grower's National Marketing Agency*.

at retail. No generalization about the share of the farmer or of any distributor puts us very far along until the reasons for the variance are examined.

REASONS FOR MARGIN VARIANCE

A little study of the figures makes clear that the value of the commodity selected, and the day, month or year for which comparison is made, have much to do with the way in which the consumer's dollar is distributed. For certain items of distributive cost, such as the transportation charge, distance between farm and market, is also significant. The latter is easily illustrated by the following comparison of freight margins on potatoes:²

<i>From</i>	<i>To</i>	<i>Freight per cent of Wholesale Price</i>	<i>Approximate mileage</i>
New Jersey	New York City	11	60
Wisconsin	Chicago	19	220
Minnesota	Chicago	27	460
Maine	Boston	31	470
Maine	New York City	42	700

The effect of retail value in establishing relative magnitude of fixed distributing costs, such as freight, may be seen in these figures:³

<i>Commodity</i>	<i>From</i>	<i>To</i>	<i>Approximate Mileage</i>	<i>Freight per cent Retail Price</i>	<i>Retail Value per Car</i>
Potatoes	Maine	Boston	470	18.2	\$980
Oranges	California	All points	...	17.1	3,280
Apples	Washington	New York City	3,000	16.0	3,780
Cranberries	New Jersey, Wisconsin, and Massachu- setts	All points	800	7.4	3,600

² Figures for movement to New York City are from unpublished records of a local carlot receiver for year 1921. Other computed from data in Cost of Marketing Division release previously cited.

³ Figures from publications previously cited except for apples, which are found in mimeographed release entitled: *Margins and Costs in the Marketing of Washington Apples 1922-23*, by K. B. Gardner, Bureau of Agricultural Economics.

Despite the limited mileage represented by the Maine to Boston potato movement in comparison to the trans-continental routing of oranges and apples, the freight item on the former is a larger share of the retail price, due of course to the great disparity in value per carlot. Because of the high value per pound for cranberries, freight is less than half as important for cranberries as for potatoes, although the average haul for the former is almost twice that of these particular potatoes.

That the particular time selected for a comparison of prices to the consumer with component costs of distribution means much in their mutual relationship can be seen in the contrast of transportation costs from year to

year for California oranges. Within five years the transportation portion of the consumer's dollar shifted from 19.5 to 12.7 and back to 22.5.

It is not impossible, then, by careful selection of time, place and commodity to establish almost any spread desired.

<i>Year</i>	<i>Retail Price per Box</i>	<i>Transportation Portion of Consumer's Dollar</i>
1917	\$4.74	19.5
1918	7.63	12.7
1919	7.80	16.3
1920	8.10	15.9
1921	7.87	22.5

Used as a tool of analysis rather than of propaganda, however, margin comparison is a valuable aid in attacking the distribution problem. With proper care in collection of data and computation of spread, and with adequate statistical treatment of results, the more important elements in marketing costs can be thrown into their true perspective.

METHODS OF COMPUTING GROSS MARGINS

There are at least two common methods of computing gross margins now in vogue. The first, usually developed in connection with accounting studies, consists of comparing purchase and sales records, cost of goods with sale value. The second places reliance on the computed differentials between price quotations for similar grades of a commodity at sequential points in the distributing system. There are, in reality, two variants of the first method. One limits the cost and sales price comparison to a particular shipper or dealer, but embraces all lots of a given commodity handled by him within a given period. The other attempts to trace through shippers' or dealers' records a particular unit amount such as carlot.

Theoretically, the advantage of working with records of actual sales bulks large. Moreover, when developed in conjunction with standard sets of accounts, gross margins can be compared with net margins, classified expenditures, stock turn, and volume of business. Actually, the success of this method depends largely upon the availability of records representing a sufficient concentration of business to afford an adequate sample. Too frequently it is necessary to assume that the record of one shipping organization or one dealer is "representative of the trade." Records of co-operative

organizations or country buyers, combining a fairly large percentage of total shipment from an area, are good sources for this type of study and have been frequently utilized. At the city end a sufficient sample is more difficult to obtain. Even the entire records of a carlot receiver may give scant data from which to establish margins for any particular variety. The study of fresh fruit and vegetable distribution by Phillips and Fraser, for example, while it covered a total of 9,476 cars, included such minimum samples as six cars of asparagus and six cars of Florida lettuce.⁴ Seven out of thirty commodity classifications contained less than fifty-car samples as a basis for computing margins. In the retail field this kind of record is doubly difficult to obtain. In accounting studies, such as those initiated by the Harvard Bureau of Business Research among retail grocers, the margins for particular varieties are obscured. Even an intensive investigation like that undertaken by the N. Y. Federal Food Board in 1918, employing the time of a large force of inspectors and accountants for several months, yielded data for only 58 groceries with general variety classes such as "onions" or "potatoes."⁵

Practically, the time and expense of such investigations are such that they cannot be made at all points in the marketing chain at the same time in sufficient volume to give a wholly complete and satisfactory picture. It is an illuminating experience to attempt to trace the subsequent sales of so small a sample as two carlots of a commodity after delivery at a city terminal market.

⁴ *The Wholesale Distribution of Fresh Fruits and Vegetables*, Phillips and Fraser, 1921, for the National League of Commission Merchants, et al.

⁵ Published by the N. Y. State Department of Farms and Markets as Circular 240—Retail Grocery Stores.

A carlot scatters to fifteen or twenty jobbers and then to three or four hundred retailers and finally to five thousand consumers. To keep a warm trail, particularly in the event of no record of cash purchasers, is a feat for any margin hound.

The second alternative, matching up sequential price quotations for a particular grade, size and unit of a commodity, has the advantage of allowing widespread simultaneous sampling and the use of currently published data such as wholesale prices, freight charges and the like. The obvious objections are that the quotations may not truly represent the bulk of actual sales or that shrinkage and deterioration, resulting in changes in assumed quality or quantity, may be such as to vitiate the comparisons. These objections carry most weight in connection with prices for extreme perishables. If all oranges were simply "oranges" for pricing purposes, comparisons would be simple; but when one finds that oranges marketed by the California Fruit Growers' Exchange are packed in ten sizes under approximately eight hundred brand names, each bringing a slightly different price at the wholesale auctions, the need for an expert matchmaker is apparent. In order not to exaggerate the difficulty, it should be said, however, that the size of the oranges is stamped on each box and that sub-brands are grouped under two or three commercial grade brands within which prices do not vary to any great extent. It is possible for collectors of retail and jobbing prices, by careful attention to details of size, grade, brand and condition, to identify satisfactorily the goods for which prices are quoted. The prevailing practice of chain stores and many unit markets in regard to price-marking their wares makes false quotation difficult to investigators who are resident consumers

of the neighborhood. Personal experience in frequent checks upon quotations of New York City jobbers, through examination of their sales slips, has shown the former to be representative of the model class of sales.

Without attempting a final conclusion as to the relative merit of the methods of assembling price data for margin calculation, it may be observed that practically all of the complete consumer dollar studies have been made by a combination of these methods. Shipping point records of prices paid to growers and returns from F. O. B. or delivered sales to city receivers are compared with collected wholesale, jobbing and retail quotations.

DIFFICULTIES IN ANALYZING MARGINS

Safely out of the frying pan of price selection one is immediately into the fire of interpretation. The basis of computing a margin may be markup on cost or percentage of selling price. When an entire series of differentials between prices are computed, it is convenient to state them in terms of the final price at the retail store, reading them as cents of the consumer's dollar. Objection can be made that the further one goes towards the consumer the more is the size of the percentage *markup* above each dealer's cost distorted by the reduction of all margins to fractions of the final price. A box of apples sold at \$5.00 retail may have cost the retailer \$3.00, the jobber \$2.50 and the wholesaler \$2.00. In terms of the consumer's dollar the margins are: retailer 40 per cent, jobber 10 per cent, wholesaler 10 per cent. In terms of each dealer's *own* selling price the margins would be retailer 40 per cent, jobber 17 per cent, and wholesaler 20 per cent. In terms of *cost* price the margins are retailer 67 per cent, jobber 20 per cent and wholesaler 25 per cent.

For ease of presentation and comparison the consumer's dollar distribution is desirable, but any interpretation must be made with care. If the purpose is to show the importance of each division of the spread in its effect upon the retail price, an analysis of the consumer's dollar is fairly satisfactory, although it must be remembered that a difference in one cent at shipping point or at wholesale may mean considerably more further along, because of the common practice of adding a percentage markup in merchandising. As a gauge of gross profit, margins derived from price comparisons must be further considered in relation to volume of turnover. The jobbers' gross margin per unit on fifteen fruits and vegetables in the New York area during 1923 was less than one-half that of the retailers', but a jobber handles about 1/700 of the total business and an average retailer about 1/10,000.

In still another direction one must be careful in interpreting percentage margins. When, for example, the margins of two types of retail stores are compared and found to differ by 2 per cent or 5 per cent, reflection will show that to the consumer the difference is even greater than first appears. A simple illustration will make clear the point. If two stores, A and B, are handling the same goods at a gross margin (in terms of the consumer's dollar) of 50 and 52 per cent, respectively, the difference to the consumer is 4 per cent instead of 2 per cent. Store A buys the goods for 50 and sells for 100. Store B buys for 48 and sells for 100. The difference is 2 cents in wholesale or cost value, which is 4 cents at retail.

$$.02 \div .50 = .04$$

Hence, when the cash-carry differential below credit-delivery is 4 cents out of every dollar, on an average

gross margin of 20 cents for the latter stores, as is found to be the case by the Harvard Bureau of Business Research, the saving to the consumer may be interpreted as⁶

$$.04 \div .80 = .05$$

In short, the difference (expressed in cents of the consumer's dollar) in distribution margins, between two types of stores merchandising a commodity, becomes significant to the consumer to the extent of the differential divided by the cost price of the commodity to one of the stores.

Further questions involving the fundamental concept of the consumer's dollar distribution are immediately raised. Does store B in the above example actually buy the goods cheaper than store A? If the actual unit prices in the two stores were averaged and compared, would the retail prices be lower in store A than in store B? When the price averages over a period are computed, it has been found that all combinations are possible. The relation of the average retail price of store A to that of store B is irrelevant, for the comparison of consumer dollar margins involves simply the relative spread between cost and sale price in each store. Theoretically, if all prices had been collected simultaneously and for varieties identical in grade, brand, size and condition, the store with the lowest margin would have the lowest retail prices. However, such identity cannot be achieved in practice. With fifty to one hundred brands and ten sizes of oranges quoted on a city auction market at slightly different prices, it is impossible to find identical fruit at fifty different retail stores. Moreover, in collecting quotations over a full season, the mean prices for two stores are influenced by the fact that one of them may cease to carry a

⁶ Bulletin 41, Harvard Bur. Res., 1923.

particular variety of produce during high price periods, thereby introducing a biased weighting. The gross margins, since they are simply computed differences between individual pairs of matched cost and sale prices, are not effected to such an extent by the period in which they are selected. To return to the original question, it may be said that the mean retail price for store A is not strictly comparable to the mean price at store B, because each represents a composite with different weights of time, grade and size. But for every dollar spent by the consumer, store A takes less for itself and pays more for the goods to the producer; or, looking at it another way and assuming that both stores buy at the same price, store A sells to the consumer for less than store B.

Agreeing, as we may, that the significance of margins depends largely upon care in collecting and interpreting them, to what use can they be put? Since the sizes of the slices into which the consumer's dollar is divided differ with time, place and commodity chosen, little can be said of "the spread" between farmer and consumer. Happily, however, the variance itself furnishes an opportunity to discover by comparison and correlation the causes of high and low margins, and thus it throws light upon possible means of reducing them.

For the last two or three years the Bureau of Agricultural Economics, in conjunction with the New England Research Council at Boston and the Port Authority at New York, has been studying the size and variance of city distribution margins on perishable foods. The high cost of retailing perishables has been variously ascribed to excessive wastage and spoilage, to the intense competition of many small store units, with resulting lack of efficient buying and management and

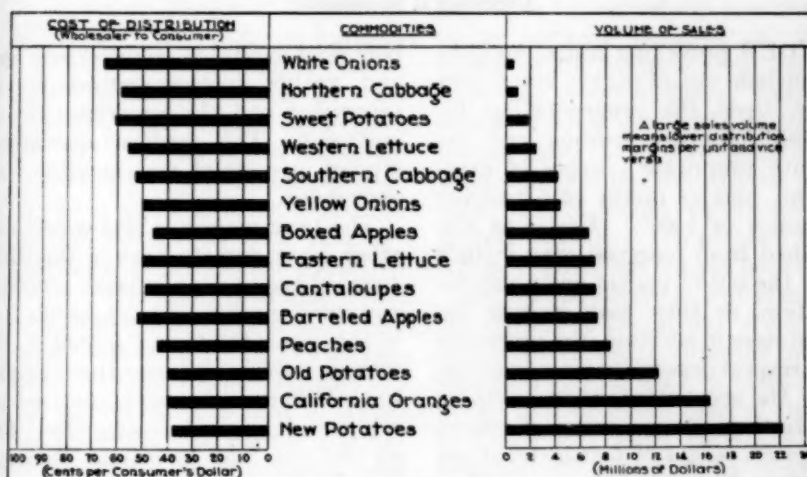
insufficient volume of business, to the increased service of credit and delivery, to the small unit of purchase by consumers. Can these hypotheses be tested and evaluated?

At Boston one analyst sought to measure the degree of risk from spoilage and extreme price fluctuations in handling a commodity by computing the quartile deviation of the margins for each variety. He assumed that a wide variability indicated greater risk. In New York the market research staff has established some significant relation between the volume of business and the size of margin for fourteen perishable varieties. Wide differences in size of commodity margin seem to be largely explained by the relative volume of business furnished by each, as shown in the accompanying chart.

A similar conclusion for foods other than fruits and vegetables may be drawn from the figures gathered by the New York Federal Food Commission. The cost studies of the Harvard Bureau of Business Research indicate that this element of volume of business may apply not only to variations in margins between commodities but between stores as well. When this hypothesis has been fully tested we may have a really accurate gauge of the economic limits of competitive merchandising, a sound answer to the question of whether the average grocery of the United States can live on the business furnished by its seventy-two and one-half families.⁷

As a result of a nine months' survey in New York City, involving the assembling of more than 10,000 retail quotations, a series of differentials for type of store management, clientele, sales policy, and degree of specializa-

⁷ P. 206, Report of Joint Commission of Agricultural Inquiry, 1921, part IV, *Marketing and Distribution*.

COST-OF-DISTRIBUTION-AND-VOLUME-OF-SALES

tion has been worked out. If substantiated by a new series, covering seven months more and now in the process of analysis, some interesting conclusions with regard to the relative importance of centralized buying and management, credit and delivery service, and other elements which are assumed to increase the cost of distri-

bution, will be available. It is believed that by using the gross margin, as the resultant, against volume of business, value of unit commonly sold, per cent decay and shrinkage and the other elements, as joint causes, an answer can be given concerning the relative importance of each to the distributive problem.

Costs and Margins in Marketing

By JOHN D. BLACK and H. BRUCE PRICE

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UNDER prevailing usage, margins include out-of-pocket costs, plus interest upon the proprietorship investment, plus depreciation and the like, plus proprietor's wages of management, plus or minus any conjunctural gains or losses. Costs, as distinguished from margins, may include simply the out-of-pocket costs and depreciation, or they may include the interest item in addition, the procedure in this respect depending more upon the bias of the accountants than anything else. In the economic sense, of course, proprietor's wages of management are as much costs as hired management or hired labor. And so is the interest on the investment. But in this article, which is to be principally a report upon the cost and margin studies as made in the field of marketing, the usage will have to be based upon practice rather than upon principle. The general practice in certain types of studies of the marketing of farm products is to consider interest on the investment as a cost, and also proprietor's wages of management, the reason given being that some of the marketing is by co-operatives, and co-operatives borrow practically all their capital from members or elsewhere, and hire practically all of their management. Costs as reported in such cases are, therefore, costs according to economic terminology rather more than according to accountants' terminology. The difference between costs and margins, according to this usage, is merely that margins include the conjunctural losses and gains due to price or cost changes, spoilage and waste and the like. In other types of studies, only interest on

borrowed capital is counted as a cost, and profits include return to the proprietor and the proprietorship investment. This applies especially to studies in costs of merchandising and conversion.

The term margin is also used in another sense, namely, that of the difference between prices in local, wholesale and retail markets. A substitute for it in this use is the term "spread." The term margin is also sometimes applied to the difference between purchase and sale price for a given commodity. Thus an elevator may have one "margin" for wheat, another for rye, another for corn, etc. In this sense, it is distinguished from "gross trading profit," which may include something more than the margin, as will be illustrated presently.

OBJECTIVES

In the last analysis, cost and margin studies in the field of marketing can have but one practical objective, namely, to lead to a reduction in the costs or margins associated with the rendering of a given amount or quality of marketing service. There are, however, at least three approaches to this goal by way of cost and margin studies. One of these is to work out the cost-structure at any given time, discover the variations in costs, both in the aggregate and by cost categories and by processes, as between different business units at any given time, and thus as a result of actually seeing how some business units have kept their costs low, point out how other business units may reduce their costs in the future. This method means the making of

cost studies with a view to discovering from them the best kind of marketing organization and management.

An approach somewhat related to this is to set up some sort of costs as standards for the various business units to attain to as norms of reasonable accomplishment, and by this means improve the practice of the more inefficient. The only norms ordinarily set up, however, are simple average costs, which must perforce include as much bad practice as good practice. Furthermore, if production standards are to be useful for a period of years, they must separate physical data from cost-rate data, so that they can be corrected whenever cost-rates change.

Another approach is that of determining if possible what costs or margins are "necessary" or reasonable, and using this information in publicity campaigns or various related ways as a means of forcing or inducing middlemen to reduce their margins. Studies of variations in costs among different middlemen have little value for such purposes. They merely show a range in costs, and do not in any way indicate what costs are necessary or reasonable. The "bulk-line" analysis is nearly futile for such purposes—it simply restates the query in other language. The best that can be said of such studies from the point of view of necessary costs or margins is that sometimes they show costs or margins that obviously are higher than is reasonable. The more promising attack is to analyze variations in costs and margins over a period of time, discovering to what extent the variations from month to month or year to year are due to changes in cost-rates for labor, equipment, supplies, rent and the like, or to variations in turn-over or utilization; and to what extent they represent lags or maladjustments between purchase and sale prices. Stud-

ies of this latter kind with such an objective have thus far proved of little immediate value so far as reducing margins are concerned, but they have helped us to understand how our marketing system behaves in various phases of the business cycle, and thus have had great scientific value. Of course, if some way could be found of forcing costs or profits down or up, when they are temporarily out of line, such results would be immediately useful. But there is a problem of control here which has not yet been solved.

Another objective in cost-of-marketing studies is frequently given much importance, namely, to secure information that can be used in bringing the public to realize that most of the present high marketing costs are really necessary, or in getting the consumers to co-operate in various plans for reducing costs along lines that require their co-operation.

A SAMPLE ANALYSIS—GRAIN

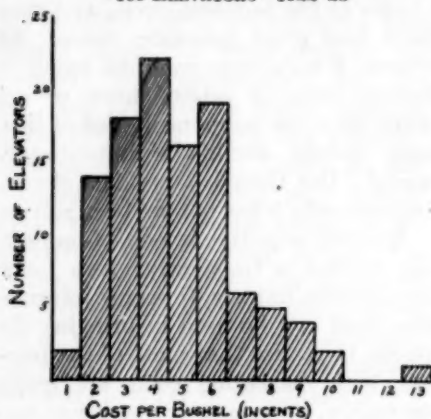
Obviously it will be impossible in this brief sketch to survey from the point of view of the foregoing objectives all of the cost or margin studies that have been made. What we shall do instead is to take one field as a sample and show in some detail how these objectives work out, and then very briefly summarize the rest. The field we have chosen is grain marketing, because more complete analyses are available in this field than in any other.

Variations in Costs of Country Elevators. Figure I shows the range and distribution of costs of 109 grain elevators in the Minneapolis-Duluth grain marketing area for the crop year of 1922-23.¹ The range was from less than 2 cents to over 13 cents per bushel.

¹ From a study made by the Division of Agricultural Economics of the University of Minnesota in co-operation with the U. S. Department of Agriculture.

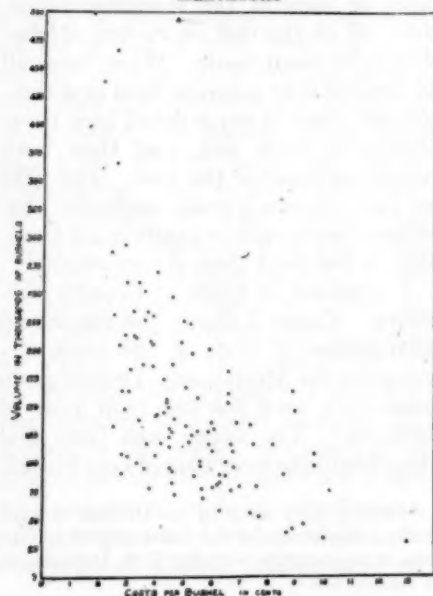
The average was 4.7 cents per bushel. Here, apparently, is abundant opportunity for a better economy in organization and management.

FIGURE I. DISTRIBUTION OF ELEVATOR COSTS
—109 ELEVATORS—1922-23



The first and most obvious cause of these variations in unit costs is volume of business. Figure II shows this general relation graphically. The decrease

FIGURE II. RELATION BETWEEN VOLUME AND
COSTS PER BUSHEL OF OPERATING FARMERS'
ELEVATORS



in cost with volume is rather rapid under 125,000 bushels, and gradual above this volume. The reason for this is that there is roughly a minimum-sized elevator building with a minimum of equipment and labor and management; and costs per bushel decrease until this minimum is economically utilized. Above this point, labor is increased, equipment is increased, buildings are enlarged somewhat, insurance and interest are increased, and particularly the salaries of management are increased. They are not increased, however, as rapidly as the volume, with the result that unit costs are apparently still decreasing at 500,000 bushels.

It cannot, of course, be argued safely from such evidence that all elevators should be larger and that there should be fewer of them. The reason that some elevators are handling so small a volume is that this is all the grain that is produced in their territory, and if the elevator were not there, the extra hauling cost to other shipping points would more than offset the extra elevator costs due to the small volume of receipts at this point. In many cases, however, one elevator at a shipping point, if properly equipped and manned, could handle all the business now handled by the two or three. If hauling costs could be determined, it would be possible to combine a curve of variations in hauling costs with volume with a curve of variations in elevator costs with volume, and so construct a curve of variations in the two costs combined. In most cases, such an analysis would show volumes of between 125,000 and 350,000 bushels, giving lowest combined hauling and elevator costs, the particular volume in any case depending more upon the density of grain production than upon anything else.

Although the variations in costs with

volume are most obvious, they are probably not the most significant. The 16 elevators with volumes between 100,000 and 125,000 bushels have costs ranging from 2.5 to 9.0 cents per bushel; the 12 elevators with volumes between 150,000 and 175,000 have costs ranging from 3.0 to 9.0 cents per bushel; and even the 15 with volumes between 200,000 and 250,000 bushels have costs ranging from 2.5 to 6.0 cents per bushel. To explain all these variations is the first task of such an analysis. Of course, there is not space enough for it in this article. One important reason for the variations is differences in the amount of management hired, or the quality of it, or in the salaries paid for the same grade of management. Thus the salaries of the managers for the elevators in the 135,000 to 145,000 group ranged from \$1475 to \$2317. Other causes of differences are difference in type of construction of the warehouse, in adjustment of size of warehouse to volume of business, in type of equipment, in completeness of equipment, in utilization of the labor, or in wages paid. Extra labor costs vary from \$207 to \$923 for the same group. Some elevators follow a close policy in providing the manager with clerical assistance, office supplies and equipment and the like; others are liberal in this respect. Differences in types of insurance carried produce a variation in the unit cost of this item of over 50 per cent. Different methods of financing produce wide variations in the cost of this item; some of these, however, represent differences in service rendered.

Building costs per bushel vary partly because not all elevators are equally well adjusted to volume of business, and partly because different grain marketing conditions permit different rates of turn-over of bin-space. The Federal Trade Commission's study

of 2,229 elevators in eight states showed an average turn-over of 3.9 times.² But the average for elevators handling corn and other grains was 5.3 times, and for those handling no corn, only 2.8 times. The marketing period for corn follows that for small grain and extends the period when the elevators are in full or nearly full use. On the other hand, increasing the number of small grains handled reduces the turn-over because it makes more bin-space necessary. Maladjustments of capacity to volume of business may be merely temporary, due to such things as a short crop and the like; or they may be the result of over or underestimating future receipts. In the former case, accurate accounting would adjust the changes each year to suit the volume received.

Another important cause of variation in costs, especially between elevators in different territory, is difference in types of grain handled, or proportion of different types of grain. Wheat costs, for example, are higher than oat costs, and flax costs higher than wheat costs.

Two things must be said about these variations in the several cost items. One is that some of them are high or low because others are high or low. For example, a high equipment cost may mean a lower extra labor cost, or vice versa. But there will be for any elevator a particular combination of labor and equipment that gives lowest unit costs—a combination with not too much equipment and not too much labor. There will be a similar least-cost combination of management and labor costs, of management and office costs, of power and labor costs, etc. The other thing is that some of the differences in costs, as already indicated in the case of interest, represent differences in the quality of service.

² Report on Grain Marketing, Vol. I, p. 120.

High salaries for management may be justified by the success of the elevator. High office costs may be justified by the better records and accounts that are kept.

The analysis of cost variations naturally resolves itself into two phases: one, that of variations in utilization of the cost elements, and the other, that of variations in the cost-rates. Thus it will be found that some elevators have high labor cost because they employ too much labor or utilize it poorly; and others because they pay high wages. Building costs will similarly vary, either because of differences in size of buildings or turn-over, or because of differences in type of construction involving different annual costs per cubic foot of bin-space. All costs can thus be separated into two functions, one the physical units of input, and the other the cost-rate per unit of input.

When such an analysis of variations in costs has been completed, it is possible, first, to point out all the reasons for high and low costs; second, to show how the costs of high-cost units can be reduced; and third, to plan new units in such a way that their costs will be as low as possible. From such an analysis, it is also possible to set up standards that are really possible of attainment, but which include very little bad practice. The standards will, of course, have to be different for different sets of conditions.

But which particular level of costs can be considered as necessary cannot, of course, be stated with any definiteness. In the first place, what particular quality of management can be considered necessary at any time?

Variations in Margins of Country Elevators. The average gross trading profit of these 109 elevators was 6.7 cents per bushel, or 2.0 cents more than the average cost per bushel. Table I

shows the range. Most of them are between 2 and 10 cents per bushel. These gross trading profits are not quite the same as margins, because they include income from sidelines and other sources, but they are nearly the same as margins and will be so considered in this analysis.³ The margins vary first of all because costs vary. In general, those with higher costs have higher margins. Second, they vary because of different marketing policies. For example, those that do not hedge are liable to realize large gains or losses. Third, those that mis-grade, mis-weigh, or mis-dock have either gains or losses in consequence. Fourth, certain types or grades of grain normally carry wider margins than others because of greater marketing risks or uncertainties.

TABLE I—RANGE AND DISTRIBUTION OF GROSS TRADING PROFITS OF 109 COUNTRY ELEVATORS, 1922-23

<i>Cents per Bushel</i>	<i>Number of Elevators</i>
Over 16.....	1
14-16.....	3
12-14.....	4
10-12.....	9
8-10.....	14
6-8.....	37
4-6.....	26
2-4.....	12
0-2.....	2
Less than 0.....	1
Total.....	109

The range in net operating gains or losses is equally significant. Of the 109 elevators 21 had net losses ranging upward to 4.6 cents per bushel and 22 had net gains of 4 cents and over, ranging as high as 10 cents.

Year-to-Year Fluctuations in Costs of Country Elevators. Table II shows by

³ Included in this 6.7 cents per bushel is 1.7 cents per bushel of income realized from sidelines and from elevator services rendered grain patrons. It is proper to do this since nearly all their costs have been charged to grain handling.

separate items the costs of groups of elevators in separate years from 1918 to 1923. Only part of the elevators in these groups are the same from year to year, but the data are consistent enough to indicate that the sample each year is somewhere nearly adequate. There are two principal causes

1920 made the interest and insurance costs higher in those years.

Beginning with 1920-21, the elevators began to reduce costs. In 1921-22 the reduction is particularly apparent. The large volume of 1922-23 raised total costs again, but made low unit costs. The years 1918-19 and 1922-23

TABLE II—OPERATING EXPENSES OF SAMPLE GROUPS OF FARMERS' ELEVATORS BY YEARS, 1917-1923

Element of expense	Average per Elevator						All years
	1917-18 (12)*	1918-19 (31)	1919-20 (32)	1920-21 (46)	1921-22 (36)	1922-23 (111)	
Building and equipment.....	\$633	\$848	\$868	\$792	\$702	\$917	\$798
Management.....	1,498	1,770	1,871	2,279	1,987	2,151	1,926
General office.....	554	696	868	704	860	1,015	783
Extra labor.....	420	416	649	573	444	616	519
Power, light and heat.....	249	297	346	396	308	367	327
Taxes.....	215	142	253	268	291	210	230
Insurance.....	514	544	717	553	340	445	519
Interest.....	625	1,004	1,228	1,119	815	916	951
Direct sideline.....	25	78	46	29	38	37	41
Miscellaneous.....	217	257	230	268	121	156	208
Total.....	4,980	6,052	7,076	6,981	5,901	6,830	6,302
Average bushels per elevator...	89,820	146,570	78,490	94,520	90,770	145,810	
Cost per bushel.....	5.54	4.13	9.01	7.38	6.50	4.68	6.01

* Number of elevators in the group.

of the variations in total costs; one the variations in volume of business, depending upon the size of the crop, and the other, the variations in the prices of the cost elements. Volume fell from 146,570 bushels in 1918-19 to 78,490 bushels in 1919-20, and costs per bushel rose from 4.13 cents to 9.01 cents. But part of this rise in bushel costs was due to a rise in prices of supplies, in wages and salaries, in interest and insurance, etc., since even with the lower volume of business, the average operating expenses were \$1024 higher in 1919-20 than in 1918-19. The higher prices of grain from 1918 to

are interesting to compare. With the same volume of business, the bushel costs are over half a cent higher in the latter year. This is principally because management, general office, wages of extra labor, and power and light are apparently not back even to the level of 1918-19 in the country elevator business. Interest and insurance are lower because of lower values for grain. Miscellaneous and direct sideline costs have been pared considerably. Thus, although there have been appreciable reductions since the flourishing years of 1918 to 1920, when money was spent rather freely because

margins were high, the reduction process is by no means completed and may never be completed.

Year-to-Year Fluctuations in Margins of Country Elevators. Table III shows the gross trading profits of these same groups of country elevators by years, and also their net profits and losses.

short crops, as in 1917-18, 1919-20, 1920-21 and 1921-22, and especially in 1919-20. But market conditions are an even more important cause of fluctuation in margins. It was advancing prices that principally produced the margin of 15.0 cents in 1919-20, and declining prices that pro-

TABLE III—GROSS TRADING PROFITS, EXPENSES, NET PROFITS AND LOSSES, COUNTRY ELEVATORS BY YEARS 1917 TO 1923—IN CENTS PER BUSHEL

	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	All years
Gross trading profits.....	8.8	5.9	15.0	2.4	7.8	6.7	7.8
Expenses.....	5.5	4.1	9.0	7.4	6.5	4.7	6.0
Net profits.....	3.3	1.8	6.0	-5.0*	1.3	2.0	1.8

* Loss.

In five years out of six, the elevators had an adequate net profit, and the heavy loss of 1920-21 was almost entirely offset by the large profit of the year previous. The net profits of 1918-19 and 1922-23 are really large when one considers the large volume of grain handled in these years. In general, margins are high in years of

duced the low margins of 2.4 cents in 1920-21.

In ordinary years, margins and expenses seem to be fairly well adjusted to each other, and leave a fairly regular net profit not far from 2 cents per bushel. Table IV, however, shows that there is a good deal of the accidental in this after all, for margins

TABLE IV—AVERAGE OPERATING INCOME OF FARMERS' ELEVATORS BY SOURCES OF INCOME—IN CENTS PER BUSHEL

Source of Income	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	All years
Grain Trading Profit.....	6.5	4.8	11.5	1.1	6.0	5.0	5.9
Wheat.....	5.0	5.3	16.7	1.6	6.5	5.8	9.3
Durum.....	1.5	2.7	10.8	6.0	5.7	4.9	5.3
Flax.....	22.0	8.9	4.8	-21.1†	6.2	8.8	4.9
Rye.....	9.3	4.6	9.0	3.2	5.5	4.4	6.0
Oats.....	6.6	4.7	7.0	-1.5†	4.8	2.8	4.1
Barley.....	12.0	6.5	10.5	-4.4†	3.3	4.4	5.4
Corn.....	-3.8†	-.1†	9.7	-1.7†	11.7	2.9	3.1
Sideline Trading Profit.....	1.8	.7	2.5	.6	1.0	.7	1.2
Miscellaneous Trading Profit*	.5	.4	1.0	.7	.8	1.0	.7
Total Trading Profit.....	8.8	5.9	15.0	2.4	7.8	6.7	7.8

* Consisting chiefly of income from elevator services.

† Loss.

vary greatly from year to year for different kinds of grain. Thus, after throwing out the abnormal years of 1919-20 and 1920-21, flax margins vary by years from 6.2 to 22.0 cents per bushel, oats from 2.8 to 6.6 cents, barley from 3.3 to 12.0 cents, and corn from -3.8 to 11.7 cents. It is only the circumstance that these elevators handle several kinds of grain that keeps their average margins somewhere nearly regular—this and the fact that wheat, the main crop of this region, has rather regular margins. In a major corn-growing region, no doubt corn margins are more regular than indicated here.

Variations in Central Marketing Costs and Margins. The two principal types of business units operating in the central market for grain are the commission firms and the terminal warehouses. If data were available, each of these could be analyzed; first, from the standpoint of variations in costs and margins at any time, and second, from the standpoint of year-to-year fluctuations in costs and margins. The only data available are the Federal Trade Commission averages for a group of six terminal elevator companies for the years 1912-13 to 1919-20, as given in Table V following. If the interest item

TABLE V—GROSS TRADING PROFITS AND EXPENSES (INCLUDING INTEREST) AND NET PROFITS OF SIX MINNEAPOLIS TERMINAL WAREHOUSES, 1912 TO 1920 *

(Cents per Bushel)

	1912-13	1913-14	1914-15	1915-16	1916-17	1919-20
Gross trading profits...	6.7	7.1	11.1	7.2	13.7	19.1
Expenses.....	4.2	4.7	7.1	4.9	8.5	12.8
Net Profits.....	2.5	2.4	4.0	2.3	5.2	5.3
Bushels handled.....	15,469,327	15,069,741	11,329,736	9,995,277	7,434,082	8,771,448

* Derived from the report of the Federal Trade Commission on the grain trade, Vol. IV, p. 163.

What values there are in studies of year-to-year fluctuations in margins and costs should now be apparent. If margins or net profits are unusually high or low at any given time, the presumption is that a maladjustment has developed which will right itself in time, but which righting can perhaps be hastened if it is understood, or especially if some means of control can be developed. Or any particular costs which are out of line at any time can be handled in the same way.

Year-to-year fluctuations also serve to point out occasional opportunities for improving marketing organization and management and thus reducing costs—but for such a purpose they have a rather limited usefulness.

had been excluded from both receipts and expenses, the net profits would have averaged about a cent per bushel more, but part of this one cent represents costs of funds borrowed to finance the companies' own operations, as distinguished from the financing of country elevators or mills. The gross margins are higher than those of country elevators. One of the reasons that they are so high is that they include the cost of a great deal of storage of grain, Minneapolis being a consuming center. The net profits, according to the Federal Trade Commission's figures (pp. 166-9) represent an average return for the period of about 19 per cent on the stockholders' investment, the lowest year, 1915-16, being 10.8

per cent. The principal cause of variations in costs from year to year is volume of business. Changes in the price of grain also affect the interest item pronouncedly. This is especially noticeable at the high prices of the 1919-20 crop year. The rise in wages and other related costs from 1917 on also increased the costs noticeably. Margins were increased at the same time, partly because of higher interest receipts per bushel on funds advanced to country elevators, partly because charges for elevator services—storing, cleaning and the like—were increased, and partly because of larger profits on merchandising operations. If space permitted, the variations from year to year in each source of income and each expense could be analyzed in detail. But this would not take the place of a study of the variations in each of these items for different terminal elevators in any one year. Such an analysis would show the costs of different elevators varying because of differences in utilization of storage capacity, equipment, labor, etc., and because of differences in the cost-rates for each of these items. Volume of business or turn-over would of course be a major item in utilization.

If the commission business could be similarly analyzed, it would be found that although margins are nearly the same for all in any one market, being largely fixed for them by the grain exchanges, costs would vary considerably for reasons that could largely be determined. The average margins in the Minneapolis market in 1922-23 were roughly as follows (in cents per bushel): wheat, 1.5; rye, 1.5; oats, 0.6; barley, 1.0; flax, 2.4; corn, 1.0. Margins have changed since 1912-13 because the commission charges have been changed. They are now on a percentage basis with maximums and minimums per bushel. Since 1920, the

minimums have been generally applicable. The rising costs that warranted the increased commission rates were chiefly those of wages, salaries, rent, and especially those of the traveling done by their solicitors.

Inter-Unit Organization in Relation to Its Effects on Costs. The whole large problem of the inter-relationship of different types of marketing units, of local and central and retail units, and different types of central units,—of the division of functions between them, of their integration and control—can be attacked from the standpoint of comparative costs and margins. A cost analysis, if properly made, may be one of the most effective ways of determining relative degrees of economy and waste in various systems of integration or lack of integration. Experience has shown, however, that such comparisons are fraught with great difficulties. Some of these difficulties are illustrated by the following:

A type of integrated marketing organization is the line elevator. The Federal Trade Commission's data on comparative costs of line and non-line elevators are not conclusive because of the large difference in volumes handled by the two. An analysis of individual items of expense shows that the line elevators realize some economies in centralized specialized management. Building and equipment costs are less because the elevators are less expensively equipped and constructed. Salaries are less, even when salaries in the central office are included. In particular, the direct costs of insurance, taxes on grain, interest on grain and sideline, heat and light and power are reduced. All of these savings are probably accomplished with no loss in the quality of the marketing service—perhaps even with some gain. On the other hand, the line houses are at a distinct disadvantage in securing busi-

ness in competition with businesses locally owned and operated, and in consequence are probably doomed to handle a smaller volume, which will make their unit costs higher.

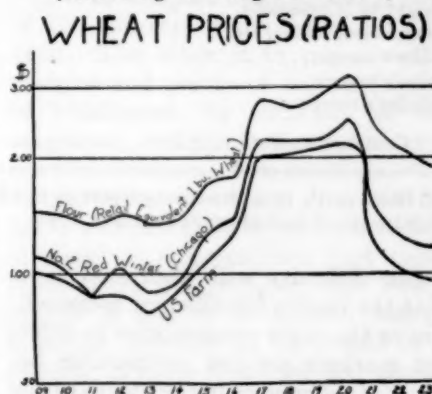
Another type of integrated organization is the wheat pool. The costs of the wheat pool of the Southwest Wheat Growers' Association in 1922-23 were 14.6 cents per bushel; of the Nebraska pool for the same year, 17.1 cents; and of the North Dakota pool, 13.7 cents.⁴ To make the figure for the North Dakota pool comparable with costs for elevators selling through commission merchants, a total of 3.8 cents per bushel must be subtracted to cover deductions for reserve, farm storage allowances, and the like. The 9.9 cents per bushel remaining may be compared with 7.75 cents per bushel, the gross trading profit of the farmer and line elevators of the same year,⁵ except that a little additional selling and testing service was furnished with the wheat pool. A detailed study of the separate items of cost for this and other wheat pools might indicate what the possibilities were in reducing costs. But the comparison of prices obtained would still have to be made. No one year or even several years of price comparisons will determine which method of selling secures better prices.

Margins Between Producer and Consumer. Studies which are easier to make are simple comparisons of movements in local, central and retail market prices. Figure III is such a comparison of farm and central market prices for wheat and retail prices for flour.⁶ The "spreads" between these prices cannot ordinarily be interpreted as "margins," for the reason that the grades are seldom strictly comparable,

and the market areas may be different. The comparison intended is simply of movements of prices in the various markets—the curves are to be understood only as indices of change. So understood, Figure III shows farm prices at present low relative to central market prices, and not showing any sign of catching up with them; flour prices high relative to both, but falling steadily—the spread narrowing 11 cents during the year 1923. The total spread was greater in 1921 and 1922 than in any previous period back to 1909. The high freight rates now prevailing are mostly responsible for the present large spread. It is this that keeps farm and central market prices so far apart. Middleman and commission costs between the central market and the consumer seem to be decreasing.

FIGURE III. CHANGES IN WHEAT AND WHEAT PRODUCTS MARGINS FROM 1909 TO 1923

(Prices are given on logarithmic scale)



Another type of analysis of this same sort is that illustrated by Table VI following. A bushel of wheat for which the farmer receives \$.97 is traced through various hands to \$5.96 worth of bread in the hands of the consumer and the margins or charges taken at each stage determined. Or the procedure is reversed, as in the second

⁴ Agricultural Co-operation, April 21, 1924.

⁵ U. S. Tariff Commission, Wheat and Wheat Products, p. 13.

⁶ The scale is logarithmic.

column, and the bread for which the consumer pays one dollar is traced back to the grower, and margins or charges indicated at each stage. As individual studies, made once and not repeated subsequently, their principal value is in giving a properly balanced sketch of the marketing process for this commodity, and thus suggesting where results can be obtained from further work directed specifically toward reducing costs. If studies of this kind can be repeated and kept up-to-date, they will have the usual value of ordinary year-to-year margin studies, and the additional value of greater precision and detail.

transportation costs from the costs and also deduct them from the consumer's price. The percentages obtained for the other margins on this basis are not percentages of actual consumer's prices, but rather indices of relative marketing costs or margins by commodities. On this basis, the margins for wheat used in bread are as follows: marketing, 18.4; conversion, 65.2; total, 83.6. The grower's index is 16.5. Perhaps the simplest way to describe these indices is to say that they represent the percentage division of what is left of the consumer's dollar after he has paid for transportation.

It will appear in the next section that

TABLE VI—MARGINS TAKEN BETWEEN THE NORTHWESTERN WHEAT GROWER AND THE CONSUMER OF BREAD IN MINNEAPOLIS, 1922-23 *

	What becomes of a bushel of wheat	Distribution of the consumer's dollar
Received by farmer.....	\$. 97	\$. 162
Country elevator's margin.....	.058	.010
Freight to Minneapolis.....	.12	.020
Commission, selling, etc.....	.018	.003
Miller's margin.....	.41	.068
Baker's margin.....	3.42	.570
Retailer's margin.....	1.00	.167
Consumer's price.....	5.96	1.000

* Based partly on a preliminary report on retail prices of bread in seven cities, issued by the U. S. Department of Agriculture in February, 1924.

One difficulty with such analysis is that the results for different commodities or the same commodities in different markets are not comparable because of differences in the length of the haul to market. In the illustration chosen, the flour haul has been eliminated by having the bread consumer in the city in which the flour is milled. Oranges are hauled anywhere from a few miles to clear across the continent. The average haul for strawberries is less than for lemons. One way of escaping from the difficulty is to omit

most of the studies thus far made in the field of costs and margins have been of this latter type. They have been of great value in helping us understand the marketing process, and we can afford to have still more of them made; but after all they represent only a beginning—most of the real work is yet to be done.

SURVEY OF MARKETING COST AND MARGIN STUDIES

On the whole, probably the most ambitious study thus far made of

marketing costs and margins is the survey made by the Joint Commission of Agricultural Inquiry in 1921 and reported in its Part IV, called *Marketing and Distribution*. Although this is principally a study of margins, the wholesale and retail margins are split into costs and profits, and conversion and certain other costs are split into two or more categories. The report divides the field into four parts: first, marketing as far as the central market or the converter; second, conversion; third, wholesaling; and, fourth, retailing. All the inquiries cover a period of years. The first part presents margins for three selected years, 1912-13, 1915-16, and 1920-21. The other three parts cover the year 1913, which is the base-year commonly chosen for comparative studies, and then the whole period from 1916 to 1921. The Commission very wisely did not attempt to make a complete summary of marketing margins and costs. Instead, it selected typical commodities, and typical grades of these commodities, and typical hauls and typical markets, and obtained the data for these alone. In some cases, however, as with fruits and vegetables, and some of the wholesaling and retailing analysis, these several typical cases are combined to give summary figures which it is believed fairly represent the whole group of which they are a sample.

One of the difficulties in using the data of this report is that one cannot in many cases tell which items have been included under costs and which under profits. Presumably profits include returns on proprietor's services and invested capital.

There is no attempt made to present variations in costs between different business units. It was not the purpose of the Commission specifically to show how costs could be reduced, but rather to discover "the cause of the wide

difference between the price of agricultural products paid to the producer and the ultimate cost to the consumer" (page 14). The studies show well how the consumer's dollar is divided between the various marketing agencies, but they do not bear on their face many indications as to which of these margins are necessary. In fact, the most obvious conclusion to be drawn from the data is that if the margins of 1913 were justified, then surely those of 1918 to 1921 are justified, for in most cases they represent a smaller percentage of the consumer's dollar.

Federal Trade Commission. A study of similar kind, although in more detail in a special field, is that which is published in Vol. IV of the Federal Trade Commission's report on the grain trade. This also is avowedly a study of profits and margins with a view to determining whether or not the profits are unreasonable. There are really two methods of attack on the problem. One is to compare margins and profits of the different years from 1913 to 1920. The other is to compare the margins and profits of different types of middlemen, for example, of co-operatives, independent and commercial line elevators. It is found that the co-operatives are doing business on lower margins than the others, and it is therefore recommended that more grain be handled co-operatively. Probably it is also to be implied merely from the largeness of the profits in a number of cases that they are unreasonable. One of the most valuable parts of this study is the analysis of causes of variations in costs from year to year (pages 22-39). One of the difficulties in using the data is the complication of hedging losses and gains. Another is that the groups compared are not always properly comparable.

The whole report of the Federal Trade Commission on profits and

margins in the grain trade is in three parts; the first part dealing with the country elevator, the second with terminal elevators, and the third with total margins between producer and consumer, the consumer in this case being the miller or exporter or feed dealer.

U. S. Department of Agriculture. The U. S. Department of Agriculture undertook its first important studies in this field about six years ago. Most of the data obtained the first two years were not in such form that they could be published. The late Secretary Wallace came to his new task just at the time when the public was firmly convinced that the middlemen were holding up consumer's prices. He therefore became interested at once in costs and margin studies. The first studies made were trends of farm, wholesale and retail prices for all the important farm products from 1910 to 1920 (see Figure III, page 193). Very shortly, however, a new section was created, called *Cost of Marketing*. Projects were undertaken in several fields, particularly livestock, grain and potatoes. Thus far no cost data have been published except a few releases, and these have not been of great value. Meanwhile, the section is shifting its energies more and more to margin studies. Releases have been published covering margins in cotton and cotton cloth, potatoes, wheat and bread, milk and meat. These cover only a single year's business, and must be described as principally giving the facts as to what the margins are at the time, and how they are split between different middlemen agencies. In general, they give little clue as to whether or not the margins are necessary, and contain few suggestions as to how margins can be reduced. The study of the retail meat trade in Chicago, Cleveland and New York, however, contains considerable valuable organization analysis.

The establishment of the special section on costs of marketing now appears to have been a mistake. Cost of marketing studies designed to furnish a basis for better marketing organization should be made by the men working in the field of marketing organization. The training required for such work is principally marketing and statistics with a small amount of accounting. Commercial cost accountants are of little use for such work except to help with the details. The margin studies are really price studies and should be made by the division in charge of price statistics, in close co-operation, of course, with the workers in marketing organization. Studies of both of these types are now being undertaken by various divisions in the Bureau of Agricultural Economics interested in marketing organization or price statistics, usually in co-operation with state experiment stations. Some results are already available in cotton, grain and butter.

State Experiment Stations. The following does not purport to be a complete survey of the research work on marketing costs and margins completed or in progress at the various state experiment stations; nevertheless it covers most of the important studies. Many of the studies are in co-operation with the U. S. Department of Agriculture. It has not been possible to indicate this fact in most cases.

California has a project under way on the margins in fruits and vegetables in the Berkeley market area. North Dakota is co-operating with the U. S. Department of Agriculture in a country elevator study which should give some cost data and permit an analysis of some of the causes of variations in costs between elevators. A dairy products marketing study under way should also give data of a similar sort. South Dakota, Nebraska and Missouri

have made limited studies in the costs of marketing livestock. The Missouri study is principally a comparison of margins when selling to local buyers and costs when selling through shipping associations. These livestock studies were part of the general project initiated in this field by the cost of marketing section of the U. S. Department of Agriculture, the results of which were published in the release previously mentioned. Texas is co-operating with the U. S. Department of Agriculture in a study of local marketing costs of cotton, and has completed a study of picking, hauling, ginning, yardage and insurance costs of cotton. It remains to be seen whether these studies will simply give cost data, or will use cost variations as a basis for suggesting improvements in organization and management.

The Kansas studies give costs in marketing butter, in marketing milk in six Kansas cities, and in some phases of wheat marketing. These studies principally content themselves with presenting averages, although the milk study gives highs and lows for each item, makes a number of suggestions as to how costs can be reduced, and compares average costs of different types of distributors. The butter study gives average costs of marketing through local creameries and through centralizers and itemizes the costs of centralizers. None of these studies analyzes variations in costs between business units in such a way as to show how costs can be reduced.

The Iowa studies are all in progress, although some data will shortly be available. They cover costs in livestock and grain marketing, and costs of local creameries. When published, they will undoubtedly analyze cost data mostly from the standpoint of variations in costs as furnishing a basis for suggestions for better econ-

omy in organization and management.

Minnesota has completed studies in the costs of local creameries, local potato warehouses, and local shipping associations, and is carrying on studies in the costs of local elevators, retail stores, and livestock and grain commission merchants. Much of this work is in co-operation with the U. S. Department of Agriculture. These studies are made almost solely from the standpoint of economy in organization and management. The emphasis is principally upon variations in costs between different business units in the same field.

Wisconsin's costs of marketing studies, mostly made between 1913 and 1917, cover potatoes, cheese, butter, milk and retail stores. There is also one study of the conversion costs of canned peas. The studies are essentially general marketing studies, but in each case an attempt was made to split the consumer's dollar between the various middlemen agencies. The cost and margin data are therefore in the form of averages. What suggestions there are for better marketing organization are therefore not derived from cost analysis. The study which comes nearest to analyzing costs from the standpoint of economy in organization is the one on retail stores.

The Cornell studies in this field were begun only recently and nothing has been published thus far. They cover potatoes, the local marketing of apples and milk, and local feed stores. It remains to be seen whether when published they will be studies essentially in costs, as most of the Cornell farm cost studies have been, or studies essentially in marketing organization.

The New England Research Council is a voluntary co-ordinating council of the various agricultural economic research agencies in the New England

States co-operating with the U. S. Department of Agriculture. Included in the council are the several state experiment stations in the region, the Massachusetts Department of Agriculture, several chambers of commerce, and the Harvard School of Business Administration. The studies thus far completed are all margin studies. As margin studies, however, they are more carefully analyzed than most of such studies. This is particularly true of two studies: one, of the reasons for differences in the retail margins taken on 12 different commodities by 6 different retail stores in the Boston market, and the other a similar study of jobbers' margins in the same market for two commodities, onions and strawberries. Reasons for differences in margins when thus carefully made virtually amount to reasons for differences in costs. Such studies do not, of course, point directly to better marketing organization and management; but they do throw considerable light upon the problem, for some of the reasons for differences in margins between different commodities and different stores are also reasons for differences between costs of stores of the same type handling the same commodity.

One interesting feature of some of these margin studies is the attempt to show variations and ranges in margins from day to day. Such analysis helps to explain the way in which the market-price mechanism works.

Only one of the studies attempts to determine costs. This is a study of the relative costs of transportation by rail and by truck.

Another study compares push-cart vendors' prices with retailers' prices.

The Massachusetts State Experiment Station, in addition to its work in co-operation with the New England Research Council, has in progress special cost of marketing studies for

apples, tobacco, onions and potatoes. It is not clear at this time what the objectives in these studies will prove to be.

A few other stations in the East have done a little work in this field, particularly Ohio, Pennsylvania, New Jersey and Maryland.

Research bureaus, especially those of the Harvard School of Business Administration and of the Northwestern University School of Commerce, have made cost studies in the field of merchandising, especially in the field of retailing. Some of these studies have emphasized the variations in costs and margins from month to month and year to year. Others have emphasized variations in costs between business units. Their analysis of the latter phase of the problem is by no means exhaustive.

Trade Associations. Several trade associations have made studies of the cost of marketing in their own fields. Their object is partly to educate the public to appreciate that their margins are necessary, and partly to help out their backward members. One of the best of these studies is that made by the National League of Commission Merchants of costs in the wholesale distribution of fruits and vegetables.

SUMMARY OF RESULTS

The foregoing survey of marketing cost and margin studies makes it abundantly clear that the principal thing that has been accomplished by them thus far is to furnish us with a clearer sketch of the marketing process. Most of them have been directed to the end of answering the question, "Who gets the money?" Recently, however, a number of studies have concerned themselves with movements in costs and margins in the various phases of the business cycle, with long-time trends in marketing costs; and the

results already obtained working along this line promise more valuable results in the future.

The most important phase of marketing cost and margin studies, namely, the economy and efficiency phase, has been by far the most neglected. There always have been attempts made to compare different marketing methods or systems in this respect, but very little that is really conclusive has been learned in this way. The difficulties of such comparisons are often unsurmountable. Even if costs can be compared, which in itself is usually very difficult, the amount and quality of marketing service rendered for the money cannot be compared. It is also frequently assumed that "average" costs, such as commonly computed, have great value as standards of reasonable attainment. As already pointed out, their value in this respect is decidedly limited. The most promising attack on the problem, namely, analyzing the costs of many units of the same general type to discover the most economical organization and market practice, has thus far been followed by only a few research agencies, particularly the research bureaus, a few experiment stations, and in some very recent studies, the U. S. Department of Agriculture. A summary of the studies thus far made would, therefore, be principally a summary of answers to the question, "Who gets the money?" These answers can be assembled and averaged in various ways. But the averages are not very significant, and they do not really represent anything in particular. The reason for this is that they are derived in different ways, represent dissimilar conditions, or include different things. In particular, transportation costs have been included in all of them, and these, of course, vary greatly according to the length of haul.

To illustrate these facts, in the following paragraphs are brought together a few general statements about margins on a number of principal commodities or groups of commodities.

The middleman margins, local and terminal markets combined, obtained by the Commission of Agricultural Inquiry, average per bushel on grains for the years 1912-13, 1914-15 and 1920-21 combined, as follows: wheat, 9.3 cents; corn, 9.6 cents; oats, 3.1 cents; barley, 6.4 cents. The Federal Trade Commission's margin on grains average for the years 1912-17 and 1920-21 combined, as follows: wheat, 11.4 cents; corn, 7.3 cents; oats, 7.0 cents. This illustrates the general lack of comparability in the available margin data. The Federal Trade Commission's figures probably represent the best comparison by types of grains; but they are all too high, probably because of assuming that all grain passes through terminal elevators, and also that most of it is stored there.

If the Commission of Agricultural Inquiry's margins are reduced to percentages of terminal market prices with the transportation margins eliminated, the comparison is as follows: wheat, 7.8 per cent; corn, 11.1 per cent; oats, 8.4 per cent; barley 11.9 per cent.

The middlemen margins (county elevator, terminal market, wholesaler and retailer combined) included in the whole marketing process from producer to consumer, on a number of food products made from grains, as obtained by the Commission of Agricultural Inquiry for the years 1912-13, 1915-16 and 1920-21 combined, were as follows, expressed as portions of the consumer's dollar: bread, 22.5 cents; corn flakes, 32.9 cents; rolled oats, 32 cents. But the U. S. Department of Agriculture's data on margins on bread sold in seven cities assign the

same middlemen only about 15 cents on the dollar. For all the commodities, the selling costs of the manufacturer are greater than the margins of the middlemen proper.

The central market margins on livestock in 4 markets, according to data obtained by the Commission of Agricultural Inquiry, averaged per hundredweight as follows in 1920-21: cattle, 15.6 cents; hogs, 18.7 cents. These represent 2.2 and 2.1 per cent respectively of the terminal market prices. Including three more markets for cattle raises the average to 16.9 cents for cattle. The central marketing costs of the co-operative selling agencies in Chicago, Kansas City and Fort Worth average 2.4 per cent of the terminal selling price. The markets included being different, the two sets of results are not comparable.

No good data are available on costs in the local markets. The local expenses of all the livestock shipped by 146 Minnesota livestock shipping associations in 1917 were 9.5 cents per hundredweight, as compared with 19.6 cents per hundredweight in the central market. In 1919, the local costs had risen to 12.0 cents per hundredweight.

The Commission of Agricultural Inquiry divided the dollar spent by the consumer for fresh beef in 1920-21 as follows: middlemen (retailers and terminal market, and not including local market) 26.5 cents; packers, 5.8 cents; transportation of livestock, 3.6 cents; shippers, 67.7 cents. For 1912-13, the comparable figures were: middlemen, 14.8 cents; packers, -7.5 cents; transportation of livestock, 2.6 cents; shippers, 90.1 cents. The amount assigned to the packer is the excess of his margin on the beef over the value of the hide and other by-products. Thus, in

1912-13, the by-products sold for 7.5 cents more than the packer's margin on the beef.

The studies of the U. S. Department of Agriculture assign to the middlemen (country buyers and city distributors) for the year 1922-23, the following portions of the consumer's dollar: Maine potatoes, 66 cents; Minnesota potatoes, 76 cents; Wisconsin potatoes, 71 cents; Michigan potatoes, 73 cents; southern potatoes, 70 cents.

A special study made by the New England Research Council on Maine potatoes sold in Boston in 1920-21 assigns 25 cents in every dollar of the consumer to the retailer, 6 cents to the jobber, 6 cents to the wholesaler, and 5 cents to the country dealer (transportation omitted).

The costs of 72 local potato warehouses in Minnesota in 1922-23 averaged 21.3 cents per hundredweight, this including cost of sacks and also a considerable amount of direct selling in carlots.

The New England Research Council's study of Connecticut Valley onions marketed in Boston assigns 58 cents in each dollar of the consumer to the retailer, 3 cents to the jobber and wholesaler, and 9 cents to the country dealer (transportation omitted).

The California Fruit Grower's Exchange divides the consumer's dollar spent for oranges in 1920-21 as follows: middlemen (wholesaler and retailers), 35.4 cents; transportation, 21.5 cents; harvesting, packing and selling by the Exchange, 12.4 cents; grower, 30.7 cents.

The foregoing is a fair sample of the sort of data which are available, and from it we may judge the value of the whole.

The Extent of Co-operative Marketing Among Farmers Today and the Results Secured by Co-operative Associations

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THE growth of co-operative marketing in the United States during recent years is noteworthy. Beginning soon after the close of the Civil War co-operative marketing has had a rather checkered career. For about thirty years, ending in 1901, co-operation was strictly in the experimental stage. The greater part of the development, such as there was, came from the Grange or Farmer Alliance inspiration. So far as number of companies was concerned there was a considerable showing made during these years, and in not a few instances the results were gratifying. The real trouble was a lack of acquaintanceship with the working principles of co-operation. Almost anything embodying the sharing of profits among a group bent on effecting savings will work so long as the enthusiasm is at its height. All manner of gaps in the way of business weaknesses may be bridged temporarily by the combined efforts of the interested parties. In the early co-operative undertakings there was no uniformity as to the ownership of stock; no adequate provisions for paying dividends on any basis other than that of stock owned; no plan of voting except on the basis of stock. In short the co-operative companies were nothing other than corporations, the stock of which was mainly in the hands of farmers.

Furthermore, the co-operative companies of this early period in almost no instances had any business connection either adequate or safe from the standpoint of their aspirations and attain-

ments. Almost all of the companies established by farmers before 1901 were strictly local in their scope of operation. They were able when things went well to effect local savings in buying or selling, but they seldom or never developed any considerable amount of bargaining power, either by way of finding the best available market at the time, spreading sales over a season, or standardizing goods. It is, therefore, not surprising to learn that out of 5,800 farmers' companies reporting to the Bureau of Agricultural Economics the year of origin, but 8.6 per cent dated back of 1901. The greater share of all those which did report having had a beginning in this early period were dairy organizations, principally co-operative creameries and cheese factories. In both of these early types there was a minimum of co-operation present, yet it is altogether a mistake to suppose that the co-operation involved in these undertakings was not genuine or important. It was both.

During the second period, 1902 to 1911 inclusive, co-operation made a distinct growth, yet only a fifth of the 5,800 co-operatives date their beginnings during these years. The dairy organizations continued to increase, but the larger numbers added to the lists consisted of grain companies. These companies were substantially all local, held together by loose state organizations. The local companies did their own buying and selling as best they could. Hence, local evils were about all they were in a position to attack.

However, the circumstances were such that a great deal of coherence was developed by these companies. They learned, and part of them practised, rational methods of distributing the profits, better called savings, and the patronage dividend became prevalent.

In the third period, 1912 to 1921 inclusive, co-operation grew by leaps and bounds. There was a great increase in the isolated local companies, a great growth in companies with some form of federation, or at least of companies centering their trade in some common agency, as livestock shipping companies, mainly local, but with a co-operative commission firm to which shipments might be made. Highly centralized co-operatives also began to make their appearance. About a fifth (20.3 per cent) of the 5,800 companies began doing business during this period.

The time of most rapid development of co-operation, both in the number of companies organized and in the amount of business transacted, was from 1912 to 1921. Almost two-thirds of the 5,800 companies (65.3 per cent) concerning which the facts are available began during this period. The outstanding development in these ten years was in an expansion of the grain, fruit and vegetable, and especially the livestock marketing companies. In type there was a pronounced swing toward something more effective than the local group. The federation and the centralized plan both grew rapidly. The amount of business handled increased more rapidly than the numbers of the companies or the total membership. Such commodities as tobacco and cotton contributed greatly to the volume of business.

Since 1921, the growth of co-operative organization has been less rapid; only 5.8 per cent of the companies on which this analysis is based came into

existence during the two years 1922 and 1923. The year 1923 was the lowest in twenty years with respect to new companies. Possibly the time has come for a smaller increase in mere numbers of new co-operative companies, the field being occupied by those already established. However, this explanation hardly seems adequate in view of the vast amount of produce still marketed along old lines, and especially in view of the dissatisfaction felt respecting this method of marketing. Whatever the explanation there is apparently a halt in the movement toward more marketing companies established by farmers, though the amount of marketing co-operatively is still on the increase. This would indicate that the companies already in the field are holding their own.

SALES VALUES

The Census Bureau in 1920, for the first time, included in its schedule of questions an inquiry as to the number of farmers belonging to co-operative companies, and the amount of business, expressed in dollars, transacted. It was found that just about ten (9.7) per cent of all farmers belonged to marketing or purchasing companies. The business done by these members in 1919 amounted, according to the reports, to \$721,000,000 of sales and \$85,000,000 in purchases. Per member the sales equalled \$1,400, the purchases \$260. Thus the bulk of the co-operative work consists in selling farm produce, the sales being over five times as great as the purchases. There were, of course, many purchases and sales made co-operatively through informal associations and not here reported, since the inquiry pertained to membership in companies and the business done through them. Probably there is a considerable percentage of error in the reports, but they have

a real value, nevertheless, especially on the assumption that the inquiry will be repeated in future censuses, in which case, in spite of errors, trends will be discernible.

The Bureau of Agricultural Economics has estimated the amount of business done by farmers' companies in 1923 at more than two billion dollars. This is almost two and a half times the amount reported by the census for the year 1919. While the increase in business had been very great it is not probable that there actually was any such growth during the four years' as these figures suggest. The Bureau of Agricultural Economics is without doubt the better authority.

The importance of the two billion dollar business may be appreciated best by comparing it with the totals involved in farmers' transactions. The aggregate value of crops and livestock products for 1923 was \$16,000,000,000, from which \$4,000,000,000, the value of crops fed, should be subtracted in order to give the net products, \$12,000,000,000. From this it will appear that the \$2,000,000,000 (the amount of the purchases, \$50,000,000, is negligible) co-operative business represents a sixth of the value of all products. In actual sales the co-operative business should be well over a sixth, since a considerable amount of the produce is sold at home without entering into the market at all. Thus the co-operative sales of nearly two billion dollars would represent not merely a sixth of the farmers' sales for the year but more likely a fifth.

It must be noted that in these co-operative sales there is involved every degree of co-operation from the least to the greatest. There is the small local creamery, cheese factory, potato warehouse, or "egg circle" doing perhaps nothing beyond assembling goods and performing some simple operation upon them in the way of

manufacture or grading, after which they are sent to the general market. Moreover there may be, and is, every sort of organization from the most informal to the most elaborate. Officers are paid all the way from nothing at all to high salaries. The goods handled may constitute an insignificant proportion of the whole supply up to three-quarters or four-fifths. In the case of the insignificant amounts such as are handled by a local elevator, creamery, or cheese factory, there is no effort at influencing the market itself, no such idea as "feeding" the market. On the contrary each unit sells when it sees fit, or when it can, just as does an isolated competitive unit of the usual type.

Large co-operative units controlling fifty, sixty or seventy-five per cent of the goods of a given kind take on some of the attributes of big business, study the market and decide when it is presumably best to make sales. The great majority of the co-operative companies are engaged in handling single commodities as the main consideration with others clustered about them as convenience suggests. Thus creameries occasionally handle eggs, elevator companies very frequently deal in seeds, twine, coal and salt. On the other hand, very few co-operative companies handle unrelated lines of produce simply because it is produced in the same general territory, or by a single group of farmers. It has been recognized for many years that one central line of interest is necessary in order to promote coherence.

PROGRESS

Judged by the amount of transactions in terms of dollars, over three-fourths of the co-operative business is done in the handling of grain, dairy products, livestock, fruits and vegetables. Following these come tobacco,

and cotton, all others being of minor importance. Grain marketing ranking first in value of produce handled, number of companies in existence, and membership, has made little progress beyond the local elevators established some twenty years ago for the primary purpose of correcting local evils. Certain other evils of a deeper nature were recognized but little or nothing done toward remedying them. A farmer-owned grain exchange was started in Minneapolis in 1908, and later moved to St. Paul. This company, not really an exchange, did a commission business involving some ten or fifteen million bushels of grain, but with indifferent and varied success. It is now in the hands of a receiver. A very ambitious program was recently launched by the American Farm Bureau Federation under the title, United States Grain Growers, Incorporated. The plan was designed to create a highly centralized organization with facilities for holding grain off the market and thereby influencing the price. It was a conspicuous example of organizing from the top down, the plan being made, not out of experience, but created as an ideal and imposed on the units below in finished form. It failed. In this connection may be mentioned the state-owned mill and elevator at Grand Forks, North Dakota. While not co-operative it is the result of a farmer uprising, the purpose being to do business in the interest of the farmer, outside of the regular trade.

While the amount of business in the grain trade done co-operatively is close to half a billion dollars, involving 332,000 farmers, the grain trade is still mainly in private hands. A recent attempt to carry the grain marketing a step farther has been made in the creation of pools, state-wide as a rule, handling some few million bushels of grain each. It has been, and still is,

the plan to increase the number and size of these pools and eventually unite them into a national pool of sufficient size to exercise price-making power. At present the prospect of such an outcome is not very flattering. The expenses of the pools have been higher than was expected and some of them are winding up their affairs.

Next on the list in the matter of sales comes dairy products. This is probably the oldest line of co-operation among American farmers. Instances of co-operation of this kind have been known for over half a century. As in grain marketing the main part of the dairy co-operation has been local. It was a feasible means of getting butter and cheese made, and so far as selling was concerned it was at least a good step ahead of the methods which it replaced. At present there are federations of co-operative creameries operating in at least three states, Minnesota, Wisconsin and Michigan. While these organizations are in their infancy they have excellent possibilities. That farmers can profitably carry their dairy products farther into the market is certain. An outstanding example of federation in the dairy field is found in the marketing of cheese. The Wisconsin Cheese Producers' Federation is handling 25,000,000 pounds of cheese per year; a similar though smaller federation is operating in Oregon; and another one is in process of organizing in the foreign cheese district of Wisconsin. These are important undertakings, yet the aggregate amount of cheese handled by the two federations now in operation is less than a tenth of the total amount for the country. The importance of the work of companies such as these is likely to outrun entirely the proportional share of the business to be done within the field. The steadying influence on the market; the feeling on the part of those concerned that they are getting all the circum-

stances will afford; the ease with which the co-operative business already under way may be expanded on occasion; all these give to the work of a co-operative company a significance beyond what it might seem to possess.

In the sale of milk co-operation has made much headway, and as a result there is some measure of co-operation at work in the bargaining of producers with distributors in and around most of the larger cities of the country. The total values mount rapidly in this line of business, not infrequently reaching \$5,000,000, or \$10,000,000 per city. While this is true, the degree of control attained by the farmers over the milk market is with few exceptions not great. The price is sensitive with respect to supply while the means of managing the supply are in most cases not adequate, and of controlling the output in the interest of price almost nothing. In this field co-operation is a means of getting what milk is worth in view of its alternative uses, whereas without co-operation there is a strong tendency toward inflexibility in prices with the farmer relatively at a disadvantage.

The most rapid rise of any type of co-operation is in connection with the marketing of livestock. Throughout the Middle West local livestock companies are found in great numbers, four, six or eight hundred per state. Livestock commission companies are operating at all the leading centers. This permits the co-operative handling of stock from the farm to the door of the packing house. The reports made by local companies indicate important savings. At the packing centers the co-operative commission organizations are able to return approximately half of the commission fees to the members. This aggregates millions of dollars but relatively is not very much, the total commission charges not amounting to any considerable share of the value of

the stock. Some ten years ago a widespread movement toward the ownership of packing plants by farmers was started. Almost without exception these ventures were failures. Hardly any of them are running as co-operative plants now and for the most part no important part of the capital subscribed was returned to the farmers at the time of winding up the business. While the co-operative packing plants have failed, the shipping of livestock co-operatively seems to have made a place for itself, and is likely to stay.

Fourth on the list in number of associations, but third in point of value of produce sold, come the fruit and vegetable companies. Here, more than in any other line, the success of co-operation grew out of dire necessity. The greatest of the fruit co-operatives are in the West. The distance from market; the perishable nature of the product; the tendency of markets to become glutted; all these conditions spelled disaster to the fruit grower under the conditions of twenty-five to thirty years ago. The most feasible way out of the difficulty seemed to be by way of co-operation. The success has been pronounced. Order and system have been introduced where before they were lacking and fruit has been made to pay where on the old haphazard method of operation it meant ruin. Almost a thousand fruit and vegetable companies report a business of over a quarter of a billion dollars a year.

Next in order of business done come tobacco and cotton. Both of these organizations are comparatively recent, and the amount of business done large. The claims concerning increase in price due to these companies are the most extravagant of any. No doubt there have been gains of genuine importance due to the co-operative handling of these crops. There was a wide gap between the prices received

by many tobacco and cotton growers and the wholesale price obtained soon after the first sale. Co-operation has resulted in giving to each a price corresponding to the quality of his product. A good observer of cotton marketing estimated in 1923 that the pooling resulted in an increase of two cents a pound over what would probably have been obtained without the pool. Less than a tenth of the cotton was sold through state pools. Whatever the facts may be as to the influence of the co-operatives on the price of cotton, it must not be forgotten that the crops for the years 1921, 1922 and 1923 were the shortest in a quarter century, not only in the United States, but for the world. The shrunken supply must have had something to do with the increase in price. Not far from half of the tobacco of the country has been sold during the past few years through co-operative companies. The claims of having doubled the price of tobacco is absurd. On the other hand, the marketing methods had been of the haphazard sort. Systematizing it meant bringing the unfortunately low figures up so as to make a reasonable, and a higher, average. There is no criterion by which to judge the increase in price of tobacco due to co-operation. It is, however, a significant amount.

BENEFITS

As noted above, incidentally there is a wide difference of opinion with respect to the benefits of co-operation. In most instances the measure of the advantage is difficult. Especially is this true where the co-operative company controls a large part of the commodity at any given market. In a case of this kind there is no definite comparison with what the goods would have brought without co-operation. On the other hand, a local co-operative, such as an elevator or creamery, can

show unmistakable evidence of gains and losses due to co-operation since the market in general has not been disturbed. This is no argument in favor of local co-operation as compared with a wider application of the principle. Still it is true that a local livestock shipping association may be able to compute its gains with accuracy, since the margins which would have been taken by private buyers are known, while the work of a co-operative commission company may show less definiteness as to advantage. The commission company may conceivably become a factor at the terminal market, in which case its gains or losses are problematical. At the same time the inferences may be convincing. No one doubts that the cranberry growers get more for the fruit through the co-operative sales than could otherwise be obtained. Neither is there doubt that the fruit growers of the West get more. How much more is a question admitting of no exact answer.

In general, it may be said that the marketing services may be performed more economically through co-operation than through private hands in all cases in which the produce is not well graded and standardized in a way comprehended by the sellers. Where grades are easily recognized local competitive buying is likely to result in a reasonably high price in relation to central market prices. This is true of choice fat stock. It is in connection with the stock not so easily classified that the savings through co-operation are oftenest made. Closely akin to the question of grades and standards is that of quantity. With few exceptions the seller with but a small amount of produce is at a disadvantage. This is the case with a large proportion of the midwestern wool growers. They have small clips of wool and therefore do not attract effective buyers capable of developing a satisfactory local market.

Hence the wool pools report, and show evidence of, important gains in price. Cotton and tobacco fall into the same class. The bulk of the sales are made by small growers who are in themselves weak bargainers. As a matter of fact the same situation obtains in most farm selling. Farming is a business of small units. Grain, cotton, livestock, butter, milk and fruit are each produced by millions of farmers. Merchants and manufacturers do business on large enough scales to permit the employment of expert purchasers and salesmen. The only method by which this situation may be matched by the farmers is through co-operation, the larger group thus developed having enough volume of business to warrant the employment of competent agencies for transacting business.

In view of the foregoing discussion it seems safe to say that the importance of the co-operative business done by farmers is quite beyond the proportional quantity of the transactions.

Co-operative companies have great possibilities in the way of education of members. The market ceases to be an unknown, unexplored, territory peopled by monsters, and becomes rather a route or highway, more or less direct, more or less perfect. Acquaintance with the route results in intelligent attempts at betterment, whereas ignorance concerning it is prolific of both criticisms and schemes mainly not pertinent. The organization of new companies while at a low ebb during the last year or two is by no means ended. The amount of business done co-operatively is on the increase and is not merely likely to continue to increase; it is sure to do so. The companies in existence are doing a larger business from year to year. The membership is increasing. The failures are growing fewer.

The following table gives the leading facts for 8,313 associations which reported to the Bureau of Agricultural Economics in 1923:

Type of Association	Associations		Estimated Business	
	Number	Per Cent	Amount	Per Cent
Selling:				
Grain.....	2,600	31.3	\$490,000,000	28.8
Dairy products.....	1,841	22.1	300,000,000	17.6
Livestock.....	1,182	14.2	220,000,000	12.9
Fruits and vegetables.....	956	11.5	280,000,000	16.5
Wool.....	93	1.1	3,000,000	.2
Cotton.....	78	.9	100,000,000	5.9
Nuts.....	46	.6	12,000,000	.7
Poultry.....	40	.5	18,000,000	1.1
Forage.....	18	.2	2,000,000	.1
Tobacco.....	14	.2	132,000,000	7.8
General selling *.....	530	6.4	92,000,000	5.4
Miscellaneous †.....	59	.7	4,000,000	.2
Buying:				
Merchandise (stores).....	479	5.8	32,000,000	1.9
Miscellaneous buying.....	377	4.5	15,000,000	.9
Total.....	8,313	100.0	\$1,700,000,000	100.0

* Selling small quantities of a large number of commodities.

† Broomcorn, maple products, honey, cane syrup, forest products, etc.

Financial Gains of Marketing Successfully Through Co-operation

By THEODORE MACKLIN

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CO-OPERATIVE marketing organization is a very useful instrument for farmers. It enables a group of producers to secure more practical information and to act more intelligently in its use than is possible for the unorganized. It is not, however, a means of guaranteeing profits to anyone, nor of changing bankrupt agriculture suddenly into a profitable industry. Co-operation is a slow-working, evolutionary process of leading men to and through the doorway of organized endeavor as a means of solving difficult problems. For those who have stubbornly persisted in applying sound economic or business principles in their co-operative endeavor, there have been decidedly worthwhile results.

According to the experience and judgment of the old and well-established co-operative companies, there are eight principal kinds of co-operative benefits. These in turn are characterized as tangible and intangible. Those benefits which are subject to actual financial measurement are tangible. They stand in contrast with those which are intangible, owing to the difficulty of measuring them definitely in dollars and cents. Briefly stated, according to the foregoing classification, these eight proved benefits of successful co-operative marketing are:

I. TANGIBLE OR FINANCIAL BENEFITS

1. Gives farmers the profits of marketing that ordinarily flow to middlemen.

2. Reduces costs of marketing so far as practicable.
3. Improves old and devises new standards of marketing service.

II. INTANGIBLE OR NON-FINANCIAL BENEFITS

1. Readjusts standards of production.
2. Establishes farmer confidence in the marketing mechanism.
3. Gives farmers conviction that products are marketed in the most efficient way possible.
4. Stimulates and develops an agricultural leadership.
5. Helps to make marketing efficient farming profitable, and living worthwhile.

Of these eight benefits, the first group alone is the object of discussion in this presentation. All of these beneficial results of marketing co-operatively obviously have not been obtained by every farmers' organization nor have they all been realized by any company. Yet this classification brings together the actual gains of one kind or another for which the co-operative movement is chief sponsor. Every marketing organization has within it the possibility of bringing to its members most or even all of these advantages. That this is the case has been repeatedly demonstrated in the practical experiences of many co-operative companies.

It is the purpose of this presentation to point out some of the more reliable and definite facts which give

an idea of the size and importance of the financial gain of successful co-operative marketing organizations. These tangible or financial advantages are not more important than the less tangible or non-financial advantages. They are however of much greater appeal to a group whose urgent need is the winning of an immediate profit.

CO-OPERATION GIVES ITS PROFITS TO FARMER

The farmers' enthusiasm for co-operation has been due in large measure to his belief that the middleman's rate of net profit was very high and represented a goodly portion of the consumer's dollar. Whatever this profit might be, the farmer has known that his co-operative company would transfer it from middlemen to himself. Assuming it to be large and also recoverable by co-operation, it is no wonder that farmers have come to look upon organization as the pathway for speedy movement out of their difficulties.

Co-operation as a form of business organization definitely gives its profits to its farmer owners and members. If reasonably efficient as an operating company in comparison with other competing organizations, the co-operative enterprise is destined to make the usual margin of net returns. While these returns vary greatly in both rate and amount from year to year, they average over a period of time only a modest figure. For the most efficient organizations, only a few in number, profits of large and attractive size are made. But for the relatively inefficient, and this class includes the mass of middlemen, either very slight profit or none at all is made. The lower limit is, of course, a net loss instead of any profit. The upper limit is uncertain, but for farm products seldom exceeds 12 cents out of

the dollar of sales or 100 per cent on the paid-up capital.

ORDINARY RATE OF MARKETING PROFIT SMALL

Investigations have repeatedly shown that the bulk of farm products yield much smaller profits than is popularly supposed. A common rate of profit is from one to four cents per dollar of sales of staple articles like livestock products, flour or butter. These profits yield from six to thirty per cent on the capital, according to the efficiency of the business management. In contrast with these rates of profit in the marketing of goods subject to continuous or fairly frequent turnover are those products which, like the canned pea, are handled by concerns highly seasonal in operation and subject to a single turnover. Such companies have received for a considerable part of the industry in a single favorable year as much as 11.5 cents per dollar of sales. This was equivalent, for the more efficient factories, to as much as 100 per cent upon the invested capital. It is to be emphasized, however, that where the rate of profit seems excessive, it is usually earned upon exceptional commodities in abnormal cases or else in connection with business where the turnover is very slow.

It is these profits, regardless of size, that the co-operative marketing organization stands its chance of making. If efficient enough to win profits against the competition of other business organizations, there is no question as to who will receive them. They will go to the farmer owners of the co-operative company instead of going, as formerly, to the owners of the private marketing system. It is the promise of this result that has been the greatest lure to draw farmers into co-operative endeavor. No motto or argument in

promotion has been more widely used than this to win membership and product for the co-operative machine.

PROFIT LEAST IMPORTANT CO-OPERATIVE BENEFIT

Yet, important as marketing profits may appear to the farmer, they are about the least important of all of the benefits which successful co-operation is able to confer upon its members. Profits differ in amount from year to year. They increase, decrease or vanish according to the relative efficiency of the company in contrast with its competitors. Thus, while profits may disappear in a year of price deflation and by their very disappearance seem to prove to the co-operator who co-operates for profit only that his organization is a failure, it should be remembered that most of the real reasons for co-operating are still valid. To obtain the usual margin of marketing profit is an insignificant reason for co-operating, in comparison with the seven other kinds of benefits flowing from successful co-operative effort.

Perhaps one great reason for the short-lived characteristic of co-operative companies is that membership has grown up on the trivial foundation that profit-winning was its chief aim and only justification. Then when profits were made and distributed as patronage dividends in the usual abundance of a few cents per dollar of sales, the farmer was justly disappointed. To be won to a large program by the appeal of an assumed reward of real proportions, which turned out to be fleeting in character and insignificant in size, is the experience of thousands of farmers. This is the great danger of using popular appeals to enlist support for movements that must, if they are to be successful, be founded upon a deeper

understanding and a more substantial and lasting type of benefits.

CO-OPERATION REDUCES MARKETING COSTS

The farmers' interest in marketing profits is inspired by a belief that their size greatly reduces the farm price receivable for commodities. This is a perfectly logical mistake. Since middlemen are assumed to be non-productive, to be stationed strategically for the levy of toll upon all that the farmer produces, it is readily understandable how farmers almost universally have gained the idea that the marketing margin or gross profit of middlemen represented an equivalent figure of net profit. Numerous investigations, however, have shown what the middleman does, what it costs him to market farm products, and the size of his net profits. From these inquiries it is definitely known that the actual costs of doing the work of marketing amount to many times the size of net profit. In fact, most of the difference between the prices received by farmers and those paid by consumers represent expenses. Only a small part is actual net profit.

The farmer has much more to gain by co-operation to reduce the costs of marketing than in co-operating to obtain the middleman's profit. If it is justifiable to co-operate to secure the usual profits, it is much more worth while to co-operate to render marketing services at less expense. This is clearly demonstrated by the experience of many co-operative institutions, whether they are handling livestock, grain, citrus fruits, nuts or cheese.

In the livestock marketing business, for example, one important middleman service is performed by the commission firm. All, or at least most, of these firms on a given market hold

membership in a trade organization commonly designated as a livestock exchange. To establish stability in the competitive standards so far as this is possible, and to give customers reasonable protection against the unfair competition that would come from a fluctuating commission rate, the livestock exchange fixes a definite commission to be charged alike by all of its members. The rate or size of the commission is determined on

livestock commission firms. In its seven years of successful history it has sold over \$155,800,000 worth of livestock. The commissions amounted to \$1,483,745, of which expenses required only \$624,383 or about 42 per cent, leaving \$859,362 or almost 58 per cent as the savings for the farmer owners.

The point of most significance in this particular illustration (brought out in Table I) is that, as the volume

TABLE I—COST REDUCTION BY A CO-OPERATIVE LIVESTOCK COMMISSION SYSTEM

Year	Value of Livestock Sold	Number of Cars	Total Commissions	Expenses	Savings	Per Cent of Commissions	
						In Expense	In Savings
1917.....	\$5,143,234	2,186	\$26,781	\$14,877	\$11,904	55.5	44.5
1918.....	18,951,140	6,916	93,474	50,844	42,630	53.9	46.1
1919.....	26,669,551	9,446	141,887	81,500	60,387	57.4	42.6
1920.....	21,660,539	9,847	157,611	72,772	84,839	46.2	53.8
1921.....	20,243,188	14,833	264,504	109,779	154,725	41.5	58.5
1922.....	27,333,516	19,962	330,534	124,436	206,098	37.7	62.3
1923.....	35,810,519	28,552	468,954	170,175	298,779	36.3	63.7
Total.....	\$155,811,687	91,742	\$1,483,745	\$624,383	\$859,362	42.1	57.9

the reasoning that it should be sufficient to permit the existing commission firms to continue operations. In other words, the membership votes to fix a commission high enough to justify the continued operation of the majority of its supporters. Inquiry shows that under these rules there are always some of the firms which make no profits because the commission is not large enough, when taken upon their volumes of business, to meet the costs of operation. It is in just such a circumstance as this that the co-operative plan successfully applied demonstrates its worth in reducing the costs of operation. An illustration of this is had in the experience of one of the older systems of co-operative

of business was expanded, the costs of running the commission firm decreased. Thus with 2,186 cars that sold for upwards of \$5,143,000 in 1917, the expenses amounted to 55.5 per cent of the commissions. In 1922 after the business had grown to over 28,500 cars which sold for more than \$35,800,000, the costs of operation had fallen to 36.3 per cent of the commissions received. Experiences of this kind demonstrate that, under the private marketing system, companies with a business of the most economical size have not been doing all of the marketing work for livestock farmers and that there is consequently much to be gained by using co-operation to force consolidation. Two results are thus

gained, one being the savings above noted and the other the reduction of commission rates. Already the commission sales rates have fallen in at least one market,¹ due to the pressure of competition between large-scale co-operative firms and equally large private houses.

(1) *Reduces Cost in Grain Commission Sales*

In the grain industry the ability of successful co-operation to reduce operating costs is more outstanding than that of livestock commission firms. The grain exchanges, like the livestock exchanges, determine upon a fixed rate of commission to be charged by all members. The Saskatchewan Co-operative Elevator Company, Ltd., as a member of the Winnipeg Grain Exchange, was required to charge the regular 1 cent per bushel commission for selling 19,449,000 bushels of grain.²

Having developed a large-scale co-operative business, its cost of operating the commission sale of grain was reduced to .21 cents per bushel.³ Thus in contrast with the private sales system requiring a commission of 1 cent, the co-operative organization was able to effect economies through increased volume of business which resulted in the reduction of cost to substantially one-fifth of the margin taken by private firms. Computed on the basis of its \$503,116 of paid-up capital,⁴ these cost reductions amounted to an equivalent of more than 30 per cent profit,

¹ Instance of commission rate reduction by the Central Co-operative Commission Association of South St. Paul, Minn.

² Province of Saskatchewan, Dept. of Agr., Co-operative Organization Branch, Second Annual Report, p. 27.

³ The Saskatchewan Co-operative Elevator Co. Ltd. News, April, 1916, Vol. I, No. 1, p. 6.

⁴ Province of Saskatchewan, Dept. of Agr., Co-operative Organization Branch, Second Annual Report, p. 27.

yet they measured only .79 cents per bushel.

(2) *Cuts Walnut Sales Costs*

Turning to the experience of the California Walnut Growers' Association, handling a specialty and relatively non-perishable product, the same general result was accomplished in cutting down sales costs. Previous to 1912, before the co-operative sales organization was put in operation, it cost local associations 7.5 per cent of the F. O. B. value of their walnuts to have them sold through the usual coast brokers.⁵ By 1922 the Association had reduced this charge to 3.25 per cent of sales.⁶ Thus by its efficiency, it saved for farmers 56.7 per cent of the former selling cost. It is this kind of saving, in this case 4.25 cents on every dollar of goods sold, that emphasizes the fact that the ability of the successful co-operative to reduce costs is a much greater argument for it than the winning of the usual middleman profits.

(3) *Reduced Sales Costs of Citrus Industry*

The longer experience of the California Fruit Growers' Exchange gives an even more extreme emphasis of the importance of co-operating to cut expenses. Before this sales organization functioned, the old-line middlemen charged 35 cents per box to sell citrus fruit.⁷ This was approximately 17

⁵ Articles of Incorporation, By-laws, Agreement and Methods of Doing Business of the California Walnut Growers' Association, Revised April 30, 1918, p. 33.

⁶ Annual Report of the General Manager of the California Walnut Growers' Association, June 1923, p. 4.

⁷ Cumberland, W. W. *Co-operative Marketing*, p. 186. Lloyd, J. W. *Co-operative and Other Organized Methods of Marketing California Horticultural Products*; Univ. of Ill. Studies in Social Sciences, Vol. VIII (March, 1919), No. 1, p. 16.

per cent of the value of the sales. In a normal year, 1921, the co-operative sales cost was 7 cents per box⁸ or only one-fifth of what it was before organization. This latter figure, let it be emphasized, was only 2.42 per cent of the sales value, while the former cost was above 17 per cent of sales. Thus the relative cost of sales in this industry has been reduced to one-seventh of its former amount.

(4) *Dealer Profits Versus Cost Reduction*

Perhaps the best available illustration, based on reliable statistics, to show the comparative importance of winning dealer profits and of effecting economies in operation, is the experience of the Wisconsin Cheese Producers' Federation. In the cheese industry, dealers frankly admit that they would be fortunate indeed to win a net profit of one-eighth cent a pound upon their entire cheese sales. Yet middlemen, in trying to make this small margin of net profit, according to evidence from a careful investigation in 1912, required a gross competitive margin for the industry of from 6.25 cents to 12.5 cents per dollar of sales.⁹ On this basis it is conservative to assume a margin of 8 cents per dollar of sales for the period preceding operation of the co-operative sales company. The anticipated middleman net profit of one-eighth cent a pound was therefore equivalent to 1 per cent of sales. Yet the cheese sales organization was able, in its ten years of operation, to reduce expenses to less than one-half their former proportion, cutting them from the figure of 8 per cent of sales to 3.43 per cent of sales. This resulted in a saving to

the farmer of 4.57 cents on each dollar's worth of cheese sold.

In this case the actual cutting of costs amounts to more than four times the ordinary rate of net profit in the cheese business, representing 1 per cent of sales. The members of this co-operative cheese-marketing company would be overlooking most of the justification for their mutual endeavor if they were content to strive merely to take over the ordinary rate of dealer profits as their main object. It is safe to say that in every line of co-operative marketing the usual rate of profit for middlemen represents a much smaller source of gain to farmers than the savings which successful co-operation is able to make by reducing the costs of operation.

CO-OPERATIVE ORGANIZATION IMPROVES MARKETING SERVICE

By far the most important source of financial benefits through co-operation lies in the possibilities which co-operation has to improve the services which marketing organizations render. The farmer is dependent upon the marketing system because he cannot as an individual do all the work or is incapable of rendering all of the specialized service which consumers or other buyers require in connection with the passage of commodities from farms to the ultimate users. At the same time, a large proportion of middlemen are only slightly better off than the farmer in respect to their ability and means of doing this work well. Successful co-operation applied to the task of rendering better service has accomplished much and will do vastly more, because it overcomes the weaknesses inherent in a condition which obliges farmers to act separately in their individual capacities.

To increase the prices which farmers receive by enlarging the percentage of the consumer's dollar that reaches

⁸ Annual Report of the General Manager of the California Fruit Growers' Exchange, 1921, p. 9.

⁹ Wisconsin Agr. Exp. Sta. Bul. 346, *Marketing by Co-operative Sales Companies*, p. 10.

them is far from a simple problem. Co-operative companies have frequently sought to do this, but their failures have been the proof of its dangers and difficulties. Yet there are organizations of notable success marketing each year an aggregate of hundreds of millions of dollars' worth of farm products. In variety these commodities include staples and non-staples, perishables and non-perishables, raw materials and finished articles, goods involving every type of problem and need for specialized service.

These organizations have found that their operations must be designed to overcome the evils of individual marketing and of inefficient private marketing. And because these evils are due in large measure to a combination of too small a volume of product and incapable management, co-operative effort seeks dependable patronage and experienced brain power. Moreover, a successful co-operative recognizes that the chief object of volume of business is that it may have sufficient work to do to justify the employment of the most expert and efficient marketing business men that training and experience afford.

The contrast between a farmer trying to market his products and the proficient marketing specialist doing it both for him and for a host of his near and distant neighbors is a mental vision which every co-operator should have. The farmer may or may not be a specialist at farming. This is the case for the reason that he may be confining his efforts to wheat growing or to milk production, either one a special line in agriculture, or he may be conducting a combination of mixed operations known as general farming. In the latter case he is not a specialist at farming. Instead he does many things instead of only one or a few.

If, in addition to his farm work, whether special or general in character, the farmer undertakes to market the output of his toil, then he ceases entirely to be a specialist. In doing many different things in a day or set period of time he has too little of each to do to become expert. Diverse work makes the jack-of-all-trades. It takes work on one thing to make a specialist. In this age of complication, successful economic effort is requiring more and more that work be done fast and well. These are the attributes of the specialist. The jack-of-all-trades works slowly and gives a poor result.

Co-operation gains its great value in guaranteeing, so far as the farmer is concerned, that the work of marketing shall be done by specialists and not by jacks-of-all-trades. Marketing breaks up into a large number of special tasks. The farmer with his small quantity of product can never hope to do his farm work efficiently and also render each of the ten marketing services. But joining with the requisite number of other men creating similar farm commodities enables farmers by co-operating to bring together both large volumes of business and the requisite talent and experience to improve service standards. In the long run, if past experience is any indication of the future, the most beneficial improvements in marketing service may be briefly grouped along four lines, as follows:

- (1) Development and use of systems to rigidly standardize both product and package.
- (2) Dependable identification, by name or otherwise, of farm products according to quality so that the prices paid by consumers may make their direct impression upon the farm management policies of producers.

- (3) Effective spreading of marketing risks which now burden farmers, a benefit made possible by large scale co-operative organization.
- (4) Elimination or reduction of speculative motives and policies in the conduct of marketing operations for farmers.

Each of these accomplishments has been demonstrated by the work of co-operatives in a number of countries. From these numerous cases, perhaps the most dependable illustration is the experience of a group of co-operators in Oregon. More complete facts are

competes directly with the same variety of cheese from Wisconsin. It is, therefore, possible to read the financial success of this co-operative organization on the scale of Wisconsin cheese prices. During the last five years of its operation, it has followed all of the scientific merchandising principles applicable, so far as is known, to its undertaking. The record of this five-year period, in contrast with the preceding period of four years, makes possible the careful measurement of increases obtained in prices. The higher prices gained by better services are accordingly shown in the following tabular presentation:

TILLAMOOK INCREASED PRICES BY IMPROVING SERVICES

Year	Pounds of Cheese Sold	Wisconsin Cheese Price. The Base of Comparison. (Cents per pound)	Net Amount * Tillamook Cheese Sold Below Wisconsin Price. (Cents per pound)	Net Amount * Tillamook Cheese Sold Above Wisconsin Price. (Cents per pound)
1915.....	4,043,875	15.09	3.30	....
1916.....	4,335,817	17.57	2.81	....
1917.....	4,974,328	24.09	2.57	....
1918.....	5,036,900	27.05	2.68	....
1919.....	6,091,259	30.11	....	.29
1920.....	6,436,600	25.71	....	1.92
1921.....	6,722,893	18.02	....	3.04
1922.....	6,615,957	19.34	....	4.45
1923.....	7,113,076	23.32	....	1.18

* Net Amount means that the difference in freight rates has been eliminated.

available in this instance than in most others to measure the actual increase in the financial reward arising from co-operative service improvement.

The Tillamook County Creamery Association is fifteen years old in marketing experience. Its volume of American cheese, for that is the commodity handled, represents less than two pounds out of every 100 produced in the United States. In the markets where it is sold, Tillamook cheese

A comparison of the first period when Tillamook prices were below Wisconsin prices with the second, when they were above, brings out the point to be emphasized. It is that before marketing services were improved this co-operative organization received 2.8 cents a pound less in the first period than did its Wisconsin competitors. After improving its services, it received during the second period 2.2 per pound more than the

price secured by its Wisconsin competitors. This difference between the first and second periods amounts to 5 cents a pound. On the basis of the 20.94 cents average price in the first period, 22.90 cents in the second and 22.36 cents for the entire nine years, a 5-cent gain in price is more than one-fifth or upwards of 20 per cent. Certainly a gain of this size testifies to the great importance of service improvement. It is many times more worth while than either dealer profits or the savings made by cost reduction. Moreover, neither of these latter benefits are as exclusively co-operative as the work of improving marketing services. For this reason, as well as for the sake of the amount of actual financial gain, the ideal to improve marketing services is the outstanding practical object for co-operating.

Taken together, the ordinary marketing profits, the savings through lower operating costs, and the higher prices, obtained by rendering more pleasing and effective service, are the three

proved sources of financial benefit through co-operation. They are the means of gaining the larger farm price which makes co-operation worth practising. In the highly-developed, older co-operative systems, money rewards of these three kinds have been received in greater or lesser degree. In some of the matured cases, perhaps as much as one-quarter of the sustained price paid farmers is directly the result of successful co-operation. That prices are greatly improved in these ways is positive. On the other hand, farm prices are not permanently doubled or trebled by co-operation. In fact, all who preach co-operation and leave the impression that it can quickly and permanently raise prices more than 25 per cent should be called upon for full information and proof as to how their assurances may be brought into practical reality. This suggestion is made not to belittle co-operation but rather to stimulate that degree of sober judgment which is required to make co-operative organizations grow and succeed.

Possibilities and Limitations of Co-operative Marketing

By H. E. ERDMAN
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IT should be stated at the outset that any discussion of the possibilities or limitations of co-operative marketing must recognize the fact that there is a wide range in what may reasonably be expected of various organizations. Just what they are in any given instance will depend upon a number of factors such as the nature of the commodity, the degree to which private business has already perfected distribution of it, upon the degree to which people are trained in co-operation, and upon whether the co-operation considered is of a local or of a larger nature.

It should also be stated at the outset that the possibilities as outlined may not necessarily soon be fully realized. As a matter of fact, some of them are beyond the range of probability for the immediate future, although decidedly within the range of possibility if sought by men of ability and clear vision. Moreover, all of them are contingent on good management. Following are some of the outstanding possibilities of successful co-operation:

POSSIBILITIES OF CO-OPERATIVE MARKETING

(1) *Standardizing and Improving Production.* In thinking of the possibilities of co-operative marketing, producers are inclined to think in glittering generalities of things a long way off—"elimination of middlemen," "price fixing," "orderly marketing," etc.,—little realizing that some of the most potent fields for fruitful activity on the part of their marketing organizations are closely at hand.

Among those closest at hand are the possibilities arising from standardiza-

tion of varieties and from improvement in production.

Producers are usually inclined to object to having the management discuss production. The management, in their opinion, has been hired to sell. It must be remembered, however, that the management is in a position to know what varieties and qualities the market demands and it should be expected to point out the facts to the membership. The sale of radio outfits has curtailed the sale of phonographs; now the phonograph manufacturers are making radio outfits. Agricultural production must likewise be made to meet demand, and the larger co-operative associations are in a position to direct adjustments.

Producers in all parts of the country do too much experimenting with varieties, whether of apples, chickens or potatoes. A survey of twenty-four farms in northern California disclosed the fact that on these twenty-four farms were being produced forty-two varieties of plums and thirty-two varieties of peaches. The manager of a nut marketing organization, operating in the same general part of the state, complains that he finds it extremely difficult to sell advantageously the nuts from this section because so many varieties must be loaded to make up carload lots. The result is that either markets are greatly restricted or additional expense must be incurred for less than carload shipments or for concentration and reloading.

A similar situation obtains in many other communities and often in an exaggerated form on individual farms. Thus an apple grower in western Ohio

a few years ago displayed sixty-eight varieties of apples grown on his own farm. For local markets such a multiplicity of varieties does not offer any particular sales difficulties. In fact, for direct marketing purposes they might even offer an advantage, but when it becomes necessary to reach wider markets the problem of distribution is made vastly more complex by the fact that every car loaded at the shipping point is likely to have a large number of varieties and that shipment may have to be made in less than carlots.

The instances cited are possibly extremes, but they indicate a general tendency among farmers everywhere to select varieties of plants or breeds of animals upon independent individual judgment rather than upon a community basis. From a marketing viewpoint, however, this only splits up the quantity marketed at country points when quantities are already too small in most communities for efficient marketing.

Co-operative organizations can do much to bring about standardization along this line by discouraging the production of the less desirable and by bringing about the general adoption of a few of the best breeds and varieties.

Again, co-operative organizations can bring about improvement in production and particularly can promote the adoption of those practices which tend to make for standard quality of product in the community. Uniformity in time and in method of spraying and pruning certain fruits makes for uniformity in appearance and color. Already in certain sections of California the spraying and pruning of citrus fruits is done by the co-operative packing associations, largely, it is true, on account of the greater efficiency thus obtained, but also because of the greater uniformity of product. For

similar reasons many of these associations have also undertaken the co-operative picking of the fruit.

Local co-operative creameries have had a difficult problem in meeting the competition of the large centralized creameries on quality. Very often their product has scored higher, but because the quality varied from time to time they could not obtain as good a price as that obtained by the large concerns for a highly standardized but lower scoring product. Recently certain groups of these creameries have come to recognize the advantages of having standardized products and have employed field men to work with the local butter makers in order to bring about uniformity.

One of the outstanding advantages gained by the Danish co-operative creameries in selling their butter on the English market arose from a similar line of action. Danish bacon offers even a more striking example of planned production. In this case it was discovered that the English trade demanded bacon from a peculiar type of hog. Thereupon the Danes set about by organized effort to produce that particular type of hog.¹

(2) *Standardizing and Improving Grade and Pack.* A second outstanding possibility for co-operative marketing organizations is also to be found near home. It consists in improving and standardizing grade and pack. Co-operative organizations, particularly the larger ones, have played an important part in bringing about not only the improvement of grades but the standardization of grades from shipping point to shipping point and from time to time. Familiar examples of a high degree of standardization by co-operative associations are brought to mind by the mere mention of "Sun-

¹ Chris L. Christensen, *Agricultural Co-operation in Denmark*. U. S. D. A. Bul. 1266.

kist" oranges, "Eatmore" cranberries, "Sun-Maid" raisins, "Diamond Brand" walnuts, etc. The greater the control of the central organization over the product the greater the possibility that a high degree of perfection may be reached along this line.

In the case of products which can be sorted after delivery by the producer, control of the local receiving house enables an association to put into effect improved grading and packing practices on short notice. With such products as berries and certain other deciduous fruits, where farmers do their own grading and packing, a long program of education may be necessary.²

What has been said of grading may also be said of packing. Improved and standardized packaging is particularly important because of the fact that sale in the wholesale and jobbing markets is so frequently made by the package. Apples, for example, are sold by the barrel or by the box, lettuce by the crate or by the hamper, berries by the crate, tray or box, peaches by the box or by the basket. Moreover, packages even of the same type frequently vary in size or in shape by such slight gradations that the eye can scarcely detect differences and certainly cannot measure them. All this leads to friction in the marketing process. Federal and state legislation have done much to bring about improvement, and co-operative organizations controlling substantial portions of various products can do even more.

Improving and standardizing grade and pack should make marketing more efficient by (1) raising the general quality of the product, (2) improving its carrying quality, and (3) permitting readier agreement between buyer and seller.

²See J. D. Black and H. B. Price, in Minn. Exp. Sta. Bul. 211, *Co-operative Central Market Organizations*, p. 75.

(3) *Stabilizing Production.* Stabilizing production in agriculture is most difficult because *first*, the biggest single factor in determining production in any one year is the uncontrollable element of weather, and *second*, because the decision as to how much to plant or how intensively to operate rests with so many different individuals, each acting independently.

Under ordinary conditions growers of apples, lemons or grapes continue to plant so long as prices are high, in spite of the fact that immense acreages have already been planted but have not yet come into bearing. Governmental agencies have already published the facts, but large co-operative organizations interested in particular commodities should go even further. At present the facts either do not reach the members or they are not correctly interpreted. By keeping their members and others thoroughly informed as to the prospects of over-planting or under-planting, it should be possible to reduce materially the violent fluctuations so prevalent in many cases today. Co-operative organizations can do much to make crop information more accurate; then they can do even more to disseminate the facts and still more to bring about intelligent action on the basis of the established facts, not only on the part of their members but on the part of outsiders as well.

There has been a tendency on the part of many co-operatives to avoid this subject because of fear of attack under anti-trust acts, state or Federal. We are probably already in an area of saner attitude toward co-operative action along this line. Big business is being urged to avoid recurring "booms" and "hard times." Why should not organized agriculture be encouraged to do the same? Certainly large co-operative associations should have at their disposal the talent to show the

public and government officials that stabilization benefits the public by preventing the recurrence of successive periods of surplus and shortage.³

(4) *Controlling Flow to Market.* The control of rate of flow to market—often spoken of as “orderly marketing”—has many possibilities for co-operative action. It has, however, been overemphasized.

Orderly marketing may mean very different things for different commodities. It may mean, for example, such an adjustment of shipments to demand as to put on the market throughout the year a fairly uniform amount each month. This is conceivable in the case of organizations marketing grain, cotton or wool. In the case of organizations handling a commodity with a highly seasonable demand, it may simply involve a rapid movement of the main crop at a particular time with a reasonable effort to lengthen the season by keeping some product on the market at all times so as to encourage year-round consumption. This, for example, is what is being done with such products as cranberries, walnuts and almonds, all of which are holiday products for which the season of active demand can only slowly be lengthened. With such products as eggs, on the other hand, orderly marketing may mean taking from the market in flush seasons a part of the product and putting it in cold storage to be moved out to the market later on in the year. This, however, involves the taking of certain speculative risks. These risks may, however, be minimized by the adoption of careful sales policies.

With an organization which controls a very small proportion of the product, the problem of orderly marketing may resolve itself into a problem of forecasting the season's price and then selling a portion of the product whenever

the price reaches or goes beyond this forecasted price. Or it may mean finding “gaps” in the market.

The California Rice Growers' Association, for example, makes a large proportion of its sales on the Japanese market. Since, however, it controls but a fraction of one per cent of the world's rice supply there is not the remotest possibility of price control. What this organization does is to attempt to forecast prices and the movement of crops of other countries. Then it aims to get into the market *between* other crops at the best prices then obtainable. This, of course, involves the use of the best available means of forecasting prices and means that the management of the association must do what individual producers ordinarily do, namely, sell the product at such times as their judgment decides the best price may be obtained. Such a policy is likely to lead to trouble when members do not fully understand and approve.

Another possibility is that of diversion of a portion of the product to other than the usual uses. A berry growers' association, for example, arranges to take off the fresh fruit market any berries which cannot be sold at a stated minimum price and sells them to canneries.

Milk producers' associations in many instances are using this method of regulating flow. In this case numerous markets are open to them—butter, cheese, condensed or powdered milks, ice cream, casein, etc.

When there are alternative outlets it is only “good business” to use them whenever they pay better than the usual outlet. Whether, however, a surplus can profitably be disposed of at a lower price than may be obtained through regular outlets, will depend upon the proportion of the commodity under control of the association and

³ See Minn. Bul. 211, pp. 60-73, *op. cit.*

upon the nature of the demand schedule for its product at that particular time. In most cases it will not pay a co-operative association to take any substantial loss in this way.

It has repeatedly been questioned whether any decided advantages will arise out of studied regulation of the flow of the product into the market in the case of such commodities as grain and cotton, which are extensively bought and sold on organized produce exchanges. The claim is that in these instances the development of a class of speculative traders has so accurately forecasted future prices that as a matter of fact the farmer might in many cases market his product at almost any time in the year which suits his own convenience, without suffering material loss, because someone is always ready to buy. In substantiation of this claim are presented figures showing the average price by months over many years, the gist of the evidence tending to show that the prices prevailing at harvest time have not, on the average, advanced by more than enough to cover storage and handling charges before another crop came onto the market. Here the probable gains from control of flow are frequently overemphasized.

On the whole, control of flow to market is full of possibility when intelligently and boldly undertaken, but is equally full of danger when undertaken without adequate knowledge of facts or skill in execution of plans.

(5) *Improving Distribution as Between Markets.* Evenness of distribution is a matter of particular importance in the distribution of perishable fruits and vegetables, especially where a given producing section must send its products to many markets and so distribute them as not to clog any one market while leaving another bare. When one area alone produces the bulk of a crop, as is the case with the Cali-

fornia lemons, the matter is relatively simple. It becomes far more complex when numerous sections compete with each other. Such is the case with peaches during certain summer months, with strawberries, and with many other fruits of like nature.

Three methods have been proposed for bringing about more even distribution. One is to put the distribution of practically all of a given product into the hands of a large co-operative organization. The second is the sale of all of the product at shipping point or early in transit through such a device as the F. O. B. auction. A third is the adaptation of the clearing house idea to the distribution of fruits and vegetables. Where co-operative associations have control of the bulk of a given product in all the leading sections, there is a possibility that these may be effectively federated after the plan of the American Cranberry Exchange. Once this is accomplished the way is open for more efficient distribution than now prevails. With most products such an ideal condition is still far away. It must not be assumed that this is a simple matter. Doubtless the distribution of the Imperial Valley cantaloupe crop would be greatly simplified if centered in one agency. But it would still involve daily adjustment as between markets to meet changing competition with other fruits, and to meet changing economic and weather conditions.

(6) *Advertising and the Development of New Markets.* It has been pointed out that there are fairly definite limits to the amount of food each person can eat and that therefore co-operative advertising of food products will simply sell certain products at the expense of others. There is doubtless a large measure of truth in this contention. It matters little, however, to the California lemon grower whose product, if

any, the lemon has displaced. Nor is the raisin grower greatly concerned if the raisin has displaced certain other foods. From the point of view of co-operative associations that are selling specific products, judicious advertising seems to have paid, and will doubtless continue to pay. It is very likely true that even so staple a commodity as the potato might benefit by advertising in years of overproduction, particularly if the advertising emphasized relative cheapness, showed new ways of using them, called attention to reliable brands, and is followed by effective sales effort. A specialty like artichokes, which is still unknown to many people, would seem to offer a particularly good field for this sort of effort.

Ordinarily large volume of business is necessary in order to carry the heavy expense of national advertising. It is not likely that private enterprises handling California oranges and lemons through a large number of relatively small agencies could possibly have advertised those products and developed markets for them in the way the California Fruit Growers' Exchange has done. Nor is it likely that any group of individual firms would have put forth the enormous effort to widen the markets which the Sun-Maid Raisin Growers' Association has put forth.

Not only, however, must there be a large volume of business to cover such expenses but there must be control of a large proportion of the total production. Exception should be made, however, to the case of organizations which restrict their distribution to a relatively small area. Tillamook cheese, for example, commands a premium on the Pacific Coast and it is to this area that the advertising of this brand has been limited.

The development of markets involves more than advertising. For

example, the development of European or Asiatic markets for prunes, for rice, for raisins, involves the establishment of sales agencies when it is known that their establishment will involve losses for a number of years. An association controlling a large portion of an important crop of which the production is increasing can well afford to undertake such activities; but no organization handling only a small portion of a crop could afford to go to such expense, because competitors would promptly step in and obtain the advantages once a market has been established.

How greatly advertising is valued by business men in general is indicated by the fact that the trade marks of certain well-known articles are valued at from six to ten million dollars; and it has been estimated that the very name "Sunkist" is easily worth \$6,000,000. At that rate each of the members of the California Fruit Growers' Exchange has an average asset of more than \$545 to

write into the value of his business of orange or lemon growing, or an average asset of \$30 per acre to write into the value of his land.⁴

(7) *Collective Bargaining.* The lure of price control has been prominent in the propaganda of many an organization campaign. Its popularity arises out of the belief on the part of the farmer that everyone but himself does control price and that he too can do so if only he and his fellows become properly organized.

Individually the farmer is a notoriously weak bargainer because

- (1) He does not know in what grade his product falls;
- (2) He does not know the relative value of different grades;
- (3) He does not know what his local price should be even when central market

⁴ California Citrograph in a recent issue.

prices are known, and frequently he cannot even interpret wholesale market quotations;

(4) He cannot follow market conditions closely enough to know at any given time whether market tendencies are up or down; and

(5) He is slow at sizing up a proposition put in a new way.

Local organization may put a group of farmers in a somewhat improved position, particularly if their product finds mainly a local market not readily supplied from outside sources. Most milk producers' associations are in this class, as are canning crop growers. Most local organizations such as farmers' elevator companies, livestock shipping associations, and local creameries merely give all their members an even chance at the wholesale market. This may, indeed, be a greater price advantage than can be obtained by any further organization, especially for the weak bargainer. It is doubtful, however, whether a very large organization of livestock producers could go much further in price making than at present, except in so far as they might influence price by controlling flow to market. So too with the grain elevators.

When an organization acquires "that substantial control" which gives it temporarily an element of monopoly, a different situation obtains. The California Walnut Growers' Association and the Sun-Maid Raisin Growers have been in this position of late years. They must and do name a price *for the crop at hand*. Their situation differs from the usual idea of monopoly in the sense that they have no control over production. They merely ask the highest price at which the consumer will take the entire crop. Moreover, this may have an element of collective bargaining, when, for example, the management advises with the trade as to the price at which the crop can be moved. Such procedure is not possible,

however, with such a product as lemons, because these must be moved out throughout the year as they mature. In this case the auctions largely determine the price as the product moves into trade channels. Centralized control of the flow to market would help stabilize price, but probably could raise it only by eliminating the "red ink" troughs.

There would seem to be no doubt as to the fact that central sales control puts producers in a much improved position over individual action. It is equally evident, however, that the price-making power of co-operative organizations is much more circumscribed than is commonly believed. The biggest opportunities lie *between the producer and the wholesale market*, although in many instances co-operative organizations can also influence and particularly steady the wholesale price.

(8) *Financing of Marketing Operations.* The individual farmer in many parts of the country has paid dearly for credit. Where commercial organizations have supplied the credit, they have had to "play safe" and have not only charged high rates but have also required producers to sell to them, thus restricting their outlets. This has been particularly true of cotton and tobacco.

Co-operative associations, where efficiently managed, can obtain credit at more reasonable rates or they may obtain more credit, or both, than can the average individual. They do this (1) on the basis of collective credit of the group; (2) on the basis of adequately warehoused goods; and (3) on the basis of collectively owned property. The net result then is not only more or better credit but greater freedom in bargaining for sale or purchase.

(9) *Making Marketing More Efficient.* Much of what has already been dis-

cussed of course falls under the above heading. There are numerous other ways, however, in which marketing can be made more efficient. Many of the large organizations have been able to correct certain abuses that had crept into business.

Again, in many instances marketing costs have been reduced. Farmers' elevators in the grain belt have often reduced costs per unit from one to several cents per bushel by increasing their volume of business. Farmers' creameries have frequently done the same thing, as have the farmers' live-stock associations. The California Fruit Growers' Exchange reduced the cost of distributing and selling fruit,—in fact just about cut it in half. Wherever costs have been cut the profits have gone back to the farmers in higher prices or patronage refunds.

This point should not be misunderstood. A co-operative association cannot do business more cheaply than private enterprise can run the same business. In fact many instances can be found where private industry has also cut costs even more drastically. In those cases, however, the savings have for the most part gone to the enterpriser as profit, while the margins were established by the less efficient. But the co-operative associations often get much more of the business of a community than any single private enterprise has been able to get and hence can cut costs.

Decreased costs should not be taken as the sole measure of efficiency. Very often there are increased services. There is probably no successful co-operative association which is not offering more services than private enterprise was offering. They have, for example, been more efficient in collecting claims, in expediting movement, in pushing sales; they have gone further in developing new markets and

in advertising the products. All of these services and others must be considered in making comparisons.

(10) *Maintaining Favorable Public Relations.* The above heading is used for want of a better designation to cover a variety of services which strong co-operative organizations can and do render. The management and officers are closely in touch with the needs of their industry. They are in an excellent position to present evidence against proposed vicious legislation or to present facts in favor of desirable legislation.

Similarly there is the occasional need for someone to appear before public bodies. A few years ago, there was a proposal for a ten per cent increase in freight rates on grain from the Middle West. Grain dealers made no protest. It mattered little to them. But the farmers' elevator companies realized that an increase in freight rates meant decreased prices for grain. Through their national organization they appeared before the Interstate Commerce Commission and won their case, saving their members thousands of dollars. Many similar instances could be cited. Enough has been said, however, to show that strong co-operative organizations serve their members in other ways than through the immediate services for which they were established.

LIMITATIONS OF CO-OPERATIVE MARKETING

Thus far I have been writing in rather glowing terms of the possibilities of co-operative marketing. There are, however, some very definite limitations. Some of these are in the nature of absolute prohibitions, others are merely difficulties which capable management may overcome.

(1) *Co-operative Associations Cannot "Fix" Prices.* I have already pointed out indirectly some of the limitations

to price control by farmers' organizations. *No farmers' organization can "fix" the price at which the product is to be sold and sell all its product unless that price also suits the consumer.* It is the old story of not being able to make the horse drink after you have led him to the water. The consumer holds the purse strings, and if the price is too high he will buy less—perhaps much less, *but always less.* And the co-operative organizations, no matter how powerful, have no way of stopping production so as to maintain any given price. They might divert some of the products to secondary uses, but if that involves lower prices they lose on the surplus, while the lump sum obtained for the product sold at regular prices has to be divided between a constantly increasing number of producers.

(2) *Co-operative Organizations Cannot "Eliminate the Middleman."* A second fallacy is that co-operation "eliminates the middleman." What is done is to replace private business units by co-operative units. True, one co-operative association may replace a number of dealers. Again, a farmers' organization may take over a series of dealers, each of whom has been playing his part in moving the product toward the consumer. The California Fruit Growers' Exchange, for example, has in its system the local house, the central exchange, and the eastern representation. These have replaced the local buyer, the distributor and the broker. This, however, is not elimination, but integration—bringing a succession of steps under one control. No large organization has thus far *eliminated* any of the important steps in the marketing process.

(3) *Co-operative Marketing Cannot Cut Costs Greatly.* This has already been discussed, but should be mentioned again at this point. Moreover, when it does devise methods by which costs

can be cut, private business will meet or beat its cuts except where they are due to increased volume of business.

(4) *Co-operative Marketing Presents a Number of Inherent Weaknesses.* One of these is the difficulty of management and membership to maintain the same viewpoint. A co-operative organization is made up of a group of individuals each of whom operates an independent business of his own, but all of whom have a common purpose in co-operating. After they have been united in an organization each individual continues to go about his own business, while the management proceeds to execute the purposes of the new organization. *There is always danger that members and management get out of step with each other.* That is, the producers, busy with their own affairs, ignore the problems of the association. The management, on the other hand, becomes so engrossed in the details of management as to lose the point of view of the members. This does not mean that the management fails to keep in mind the interests of the members; *it is just as serious, however, from the point of view of harmony and efficient functioning, if the management interprets the needs of the members differently from the way the members themselves interpret them.*

Thus even though the management is capable and sincere there is a real possibility for serious misunderstanding if the growers do not understand changes in the policy of the management or if they come to believe that the management has not followed their original intentions. Other inherent weaknesses are that members become apathetic and fail to vote or that they vote for politicians instead of for men of ability. Again there is the strong tendency toward extravagance. The management may figure that a given expenditure costs but a fraction of a cent per

unit—but the farmers later see the lump sum.

Finally there is often at the start an "over sold" condition among the members of a new organization. Seldom, indeed, can a large organization be formed without raising hope too high. Then follows disappointment, contention and complaint, which only the

most patient and capable of management can overcome. Indeed, here lies one of the big jobs of the manager of a co-operative association. He must not only be an efficient manager but must keep his membership with him. He must have such a vision of what a strong organization can do that his enthusiasm becomes contagious.

Sound Principles in Co-operative Legislation

By JOHN D. MILLER

President, National Co-operative Milk Producers' Federation

CO-OPERATIVE legislation should meet the needs of those engaged in co-operative marketing as other laws have met the needs of those who for generations have been engaged in collectively making and selling wide varieties of articles and commodities.

In early days a partnership was usually the form of organization adopted by those engaged in such co-operative efforts. This method of combining, however, was found unsatisfactory.

EARLY EFFORTS

The difficulties surrounding any attempt to continue the partnership after the death of members, coupled with the liability of each member for all partnership debts, caused this form of combined effort to be both cumbersome and hazardous.

Many of the states then enacted laws authorizing the creation of limited partnerships under and by which those engaged in such combined efforts incurred no personal liability for debts of the partnership, they risking only the funds they invested therein.

This mode had many limiting factors, and to meet the needs of the growing industrial and commercial systems of the country nearly all of the states enacted laws authorizing the creation of corporations through and by which many persons could combine to collectively engage in any form of industrial, commercial or financial business without personal liability (with a few minor exceptions) for the debts of the corporation. The corporation as such does not die with the death of any of its members but may be created to exist a long term of years, and, by the laws of

many of the states, may have perpetual existence.

These laws, enacted to meet the needs of rapidly growing industrial, commercial, and financial systems, have been distinctly beneficial. While some of the great corporations have sometimes abused their power, as a whole they have kept pace with and each a part of the wonderful development of industry and of commerce, and their elimination would be a distinct step backward.

All of these laws, however, contemplated that the corporations thus formed would own and operate production plants as well as marketing agencies.

Co-operative marketing by farmers is not new. For generations farmers in many localities have been engaged in such efforts. These co-operative organizations were usually community organizations. Experience, however, convinced those engaged in such efforts that there was a supreme necessity to combine in larger and still larger numbers if they were to function efficiently. Recognizing this necessity, large organizations have been formed, some of them with sales reaching \$100,000,000 each year.

It is not expedient, however, for farmers to vest the title of their farms and herds in a corporation that would own and operate the farms as well as sell the products, and the problem presented was to obtain such remedial legislation as would permit farmers to continue to produce singly, but from that point on to emulate the efforts and practices of those engaged in other large undertakings by acting together

in processing, preparing for market and marketing the farm products of those thus engaged.

As long as farmers formed and operated only local or community selling organizations they were unmolested; when, however, they commenced to form large organizations their right to thus combine in large numbers was immediately challenged.

Indictments under state laws were found against them in California, Minnesota, Illinois, Ohio and New York; and under the Federal law in Louisiana. The Federal indictment in Louisiana was dismissed upon demurrer; the indictment in New York was dismissed after the legislature amended the law; the defendants in the remaining indictments were tried before a jury and in each instance acquitted. The annoyance and expense of such litigation was, however, a burden greater than some of them could bear. All were weakened and some destroyed.

These indictments were found under the anti-trust laws, and while farmers insisted that in combining to sell their products jointly they were not violating such laws, it became necessary to have such laws clarified in order that there might be no question of their right to act. Many of the states did this, while by an act approved February 18, 1922, Congress amended the Federal law, the first section of such amendment, reading in part, being as follows:

That persons engaged in the production of agricultural products as farmers, planters, ranchmen, dairymen, nut or fruit growers may act together in associations, corporate or otherwise, with or without capital stock, in collectively processing, preparing for market, handling and marketing in interstate and foreign commerce such products of persons so engaged. Such associations may have marketing agencies in common; and such associations and their

members may make the necessary contracts and agreements to effect such purposes.

These state and Federal amendatory laws seem to have met with public approval, so that now not only is it the right of farmers to thus act unchallenged but in so doing they have the moral support of all forward-looking persons in both city and country.

This résumé of legislation is but a preamble to the discussion of the subject of this article; i. e., *Sound Principles in Co-operative Legislation*.

FUNCTIONING OF CO-OPERATIVE LEGISLATION

In their work of selling farm products and buying necessary supplies, together with their dealings with transportation, financial, and other business concerns, the operations of a co-operative marketing association differ little, if at all, from old line corporations. As to such dealings the provisions of general laws equally apply.

Co-operative legislation, therefore, must refer particularly to the relation of members to their co-operative association and to each other.

The method almost universally adopted by farmers in their co-operative marketing efforts is to create a selling organization, usually corporate in form, which they control by the election of directors and which is clothed with broad powers both as to sales and as to the distribution of the proceeds of sales.

It follows that legislation affecting these mutual relations should be such as will permit farmers to contract with each other and with their association as they think conditions in the region where they operate and the nature of the commodity require.

Any attempt to create a statutory mould for all would tend to retard and obstruct the work of many. As well might clothing manufacturers make

every suit of one size and pattern. They would fit a few, but would not fit the many.

The language of the first section of the Federal Co-operative Act above quoted is a model for Federal legislation. In clear and concise language it confers broad powers, thus enabling those creating an organization to so write their certificates of incorporation, their by-laws, and their mutual contracts as state laws, regional conditions and the character of the commodity may dictate.

The Federal law above referred to seems to remove all obstacles to farm marketing organizations engaging in interstate and foreign commerce.

Such marketing organizations, however, are created under state laws and these should

First: Clothe these associations and their members with broad discretion as to the form of their organization and the provisions of their mutual contracts; and

Second: Include adequate provisions to insure control of the organization at all times by the members whose products the association is selling.

Discussing these in their order, it may be stated that while marketing contracts signed by farmers are in form a contract between each member and the organization, in substance and legal effect they are contracts of the members with each other, in which they agree that for a definite period they will jointly market certain of their farm products, the association being merely the agency created by members to execute and perform such mutual contracts.

The provisions of such contracts are without the scope of this article. Sufficient here to state that they should be such as the needs of the locality and the character of the commodity require, and, among other things, should

provide adequately financing the selling organization.

As the control of the selling organization by the members is of the first importance, the statute should provide methods by which such control may always be exercised. In large organizations covering a large territory with some members hundreds of miles distant from others, methods are sometimes provided by which ballots for directors may be cast by members at many local and convenient points. In other organizations directors are selected by delegates at an annual meeting.

Beyond all question proxy voting should not be permitted. This method lends itself too easily to the ends of ambitious and designing persons desiring to acquire a voice in the control of the association.

Here enters also a material difference in the method of control from that adopted by old line corporations, in which each shareholder has as many votes as he owns shares. Whatever method is adopted to finance the organization, the fact that one member contributes more than another should not give any greater voice in control. Usually it will be found that each member contributes, whether in the form of loans or of stock subscriptions, in proportion to the services rendered him by the organization. Each should receive the same rate of interest on loans or dividends on stock, but the vote of no member should be weighed by the amount of his loan or stock holdings.

Such interest on loans or dividends on stock should not be materially more than the usual interest rates in the region where the organization operates. The purpose of membership is not to make a profit upon their capital investments, but to efficiently market their farm products. It is as important

to those operating small farms as to those operating large ones that the prices they receive for products are fair, and each should, therefore, have an equal voice in control, differing in this respect from shareholders in old line corporations, whose only return on their investments is measured by the rate of dividends.

Statutes having provided methods by which control of the organization is at all times in the members, should then leave the members at liberty to clothe the directors elected by them with adequate powers to quickly decide all business problems that may be presented to them. In other words, the control of the organization must be in the members; the control of the business must be centralized in a few men selected by the members, else will such organizations be unable to cope with other great organizations with which they must deal and in which control of the business is centralized.

It may be that there is more danger of statutes going too far than in not going far enough. They should be written in general terms, and after providing methods of membership control should leave to members a wide latitude of discretion as to the organic and

contractual relationship of members with each other and with the organization. They should be a grant, not a limitation, of powers.

The Uniform Co-operative Marketing Law now written on the statute books of many of the states received the hearty commendation and support of co-operative marketing associations because it recognized these basic principles.

With all the states enacting such a law, further Federal or state legislation may well be delayed until experience has shown what, if anything, more is necessary.

SUMMARY

It may be stated that principles of co-operative legislation should not be confused with details. Principles are few; details, many.

State statutes providing easy and convenient methods for control of the organization by members with easy and convenient means of incorporating the associations should be so written that the multitudinous details of the contractual relations of the members with each other and with the organization should be determined by the members themselves and not by statute.

Marketing Fluid Milk in Philadelphia

An Experience in Sales Co-operation

By R. W. BALDERSTON

Secretary, Interstate Milk Producers' Association and Philadelphia Dairy Council

IN order that the morning milk shall be regularly placed on every one of the 400,000 doorsteps of Philadelphia every day, a highly developed organization and a number of contributing agencies must function properly. Every quart of this milk must be palatable and conform to guaranteed standards of quality and safety.

The public has a right to and does demand that the very latest discoveries of science be applied to the safeguarding of the milk supply. The milk is highly perishable, therefore it must be collected, transported and distributed with extreme celerity. Since our large cities have had to go farther and farther out into the country to get adequate supplies, the transportation problem has become more important.

IMPORTANCE OF THE INDUSTRY

Milk is absolutely essential to human life, and forms, or should form, a large proportion of the daily diet, therefore the public has a right to expect that the price at which this milk is delivered is the very lowest possible price at which milk can be produced and distributed with fair compensation to producer and distributor. So the milk business of a great city makes a fundamental contribution to the public welfare in that it takes on social and economic aspects far beyond that of returning a fair and stable livelihood to those engaged in the production and distribution of the product. The farmers engaged in producing milk for sale in Philadelphia and other great cities have come face to face with some of the problems of our complex American life to a greater degree and in a more intimate

way than probably any other group of our farmers, certainly more so than any other group of equal size and financial importance.

Few people have ever fully realized the magnitude of this great dairy industry. We think of cotton as one of the great American agricultural products and so it is. The United States produces a large part of the world's supply of cotton. We think of wheat as a great agricultural product. It is. The United States wheat farmers grow enough to supply over 110,000,000 people their daily bread and still there is usually a substantial surplus for export. We think of potatoes as an important crop. We all eat United States grown potatoes every day and many of us two or three times a day. Yes, potatoes are important, too.

But the farm value of the milk produced on the farms of the United States is greater than that of the cotton crop, the wheat crop, and the potato crop combined. Of this milk, slightly less than one half is consumed as fluid milk. So the money received from the sale of fluid milk forms one of the most important sources of farm revenue.

EARLY DEVELOPMENTS

Before 1916 in Philadelphia, as in many other American cities, much progress had been made along some lines looking toward the practical and permanent solution of the big problem of an adequate, safe supply of fresh milk. The city had adopted standards for milk which insured its safety as a human food through proper pasteurization or special care and inspection in handling on the farm and in the dairy

when sold as raw milk. The enforcement of these requirements had practically eliminated the possibility of milk-borne epidemics of disease. Another step was the passage of an ordinance providing for the delivery in glass containers of all house to house deliveries. The quality of the milk was further insured by the requirement that all railroad cars carrying milk must be iced during hot weather to insure delivery at Philadelphia at as low a temperature as possible.

Already a number of milk dealers had enlarged their organizations through energy and careful, intelligent, business practices until they had a business of sufficient size to care for seasonal surpluses economically through the sale of by-products, to standardize materially their distribution on wagons, to cut the costs of handling in their plants because of large volume operations and particularly to arrange to secure a regular supply of milk for daily deliveries through country collecting plants where milk could be received from the farmers, promptly cooled and shipped in carload lots to Philadelphia, and where by-products could be manufactured most economically. Some of these plants were already as much as one hundred miles from the city and each one received daily the milk of fifty to one hundred farmers.

These developments, particularly of the country receiving plants, were recognized as a distinct forward step, but the rapid growth and consolidation of big distributors were viewed by the farmers supplying the city with a certain amount of fear and distrust. Milk-shipping farmers had been accustomed to bargain individually month by month for the sale of their milk to individual dealers, each one of whom handled the milk of two or three, and generally not more than a half dozen farmers. If the dealer had too much milk and refused a farmer's milk, the

farmer immediately came to town to sell it to another dealer, of whom there were many hundred in the city. If the dealer needed additional milk or was not satisfied with the quality of that which was supplied him, he went out into the country and visited some additional farmers and bargained with them for their milk. If he could find no farmer who had been shipping to Philadelphia and whose milk was available at the time, the dealer induced one of the butter creamery shippers to stop going to the creamery and to ship to Philadelphia, offering a slightly higher price than that which he had been receiving. All increases in demands on the part of the rapidly growing city were met by movements of this kind.

ORGANIZING THE FARMERS

The farmers began to talk about a "union." There were mutterings such as "down with the middleman." The resistance of the public to any price increase in the face of rapidly increasing production costs brought matters to a head in 1916. It is true that there had been for years in the counties nearest Philadelphia a "Milk Shippers' Union," delegates to which met with more or less regularity in Philadelphia and discussed the milk market situation, but the actual bargaining remained individual in character. The "union" had little or no dealings with the "big" distributors, who largely ignored its existence. It was manifestly impossible for those whose milk went to Philadelphia through a receiving station to enjoy the freedom of bargaining which the so-called direct shippers to small dealers had most jealously retained to themselves.

This situation provided a very fertile field for the formation of a broad organization of farmers to act as a collective bargaining association in arriving at a fair price for the milk of all the farmers delivering to all the

dealers in Philadelphia, both large and small. It was comparatively easy in 1916 to organize the Interstate Milk Producers' Association among the dairy farmers in fifteen of the counties supplying Philadelphia.

GOVERNORS' TRI-STATE MILK COMMISSION

About the same time, some far-sighted civic leaders suggested a milk commission be appointed by the governors of the four states supplying Philadelphia, which should investigate the whole milk marketing situation and report back to farmers, dealers and consumers alike. The immediate result of the hearings of this commission was to satisfy the *consumers* of Philadelphia for the first time that, in order to have an adequate supply of milk for themselves and their children, the price to producers would have to be sufficient to enable the farmers to continue in business. The need of an immediate advance in price was clearly shown. The *producers* recognized that in order to market their milk successfully they must have in Philadelphia a sales representative who would be in a position to keep in close touch with the whole market situation from day to day and to act as a bureau of information for the public seeking light on this important food problem. Shrewd *milk distributors* soon learned the value of laying all their "cards on the table" before a fair-minded tribunal of this kind as a means of establishing and maintaining public confidence. It is beyond the scope of this paper to trace in detail the gradual development of the relationships between the producers, distributors and the general public in the Philadelphia milk market from 1916 to the present time. I will refer to only a few events of the past eight years.

The man chosen chairman of the so-called "Governors' Milk Commission" happened to be a young professor at

the Wharton School of the University of Pennsylvania, who was practically unknown at the time to either milk producers or milk dealers, but of whom the public had heard somewhat through his connection with certain investigations of public service corporations. The producers naturally looked with much suspicion on a professor and milk dealers felt they had good reasons for being antagonistic to anyone who asked them to open to him their books to satisfy the public of the fairness of the charge made for collecting, processing and delivering milk. Neither group knew where such an investigation was going to lead them.

The public, which had little or no information to *give*, was naturally interested in the attempts of this young man, Dr. Clyde L. King, to *get* information for them. But he soon satisfied both the farmers and dealers that they could not successfully arrive at a decision as to what was a fair price for milk in the city of Philadelphia without a disinterested party with a sound training in economics being given all the facts and being allowed to interpret them in terms of a fair price. Soon both producers and dealers joined with the public in inviting the good offices of Dr. King as an arbitrator for the milk industry. The coming of the Federal Food Administration placed Dr. King quite logically in the position of milk administrator for Philadelphia and Pennsylvania, and before long, for neighboring cities and states.

CO-OPERATION THROUGH CONFERENCE

The producers (the Interstate Milk Producers' Association) and dealers, for the first time in the history of industry, began to have conferences to discuss their differences as well as mutual problems. At these conferences the questions were those of market

situations and no time was lost in inconsequential personal bickerings. The dealers found that when the representatives of the farmers' organization made a bargain the farmers kept it, living up to the arrangement which had been made. A large majority of the dealers recognized the authority of the Interstate Milk Producers' Association to act for its growing membership, already about 2,500. A few dealers who at first objected to dealing with "organized" farmers soon learned the futility of attempting to ignore the organization.

Throughout those trying years of the war with production and distribution costs mounting daily, the representatives of the producers and of the distributors learned to work together so as to "carry on" the fluid milk industry and distribute milk to the consumers of Philadelphia at as low a price as was possible. Through co-

operative effort, the cost of distribution was cut at every point. The farmer's price, meanwhile, averaged as high or higher than the value of dairy products in surrounding markets, thus insuring as far as possible an adequate supply. But one example of this effort need be given. Through mutual agreement the minimum quartage on milk wagons in Philadelphia was placed at 400 quarts while the maximum delivery per man per wagon in many other cities was 250 quarts. Through stimulation of wagon delivery and discouragement of store delivery, the price of milk to consumers, all delivered at the door, was kept much lower than the price of bottled delivered milk in cities which had large store trade and in most cases the Philadelphia delivered price was but slightly, if any, above the cost of milk on the so-called "cash and carry" plan through stores, common in other cities.¹

¹ MILK PRICES IN PHILADELPHIA AND OTHER LEADING CITIES.

(Quoted from Survey, "Milk Marketing in State," U. S. Department of Agriculture, 1924.)

The position of the market-milk industry in Philadelphia has often been the source of favorable comment. Not only has the price of milk to the consumer been low when compared with the prices of other important foods in the city for several years past, but when compared with milk prices in other cities in this section of the United States it is also low. From the U. S. Bureau of Labor Statistics the following table has been compiled, comparing the retail price per quart of milk in Philadelphia with that of other cities in this section.

Average Annual Retail Price per Quart for Fresh Milk in Certain Eastern Cities of the United States
(Data from the U. S. Bureau of Labor Statistics)

Year	Baltimore	Boston	New York	Philadelphia	Pittsburgh	Washington
	(cents)	(cents)	(cents)	(cents)	(cents)	(cents)
1913.....	8.8	8.9	9.0	8.0	8.8	8.6
1914.....	8.7	8.9	9.0	8.0	9.2	8.6
1915.....	8.8	8.9	9.0	8.0	9.3	8.6
1916.....	8.9	9.1	9.2	8.2	9.5	9.2
1917.....	10.7	11.9	11.9	10.2	11.2	11.2
1918.....	15.6	15.0	14.5	12.9	13.6	14.8
1919.....	15.2	16.0	16.1	13.6	14.8	16.1
1920.....	15.9	17.4	16.7	14.3	15.7	17.1
1921.....	13.	15.7	15.1	11.8	14.1	15.0
1922.....	12.1	13.6	14.6	11.3	12.5	13.4
1923						
1st 6 mo.....	13.	14.2	14.8	12.2	14.	14.

To a casual observer a conference between producers and distributors in the Philadelphia Milk Shed might seem a rather indefinite and unbusinesslike method of settling questions arising from the sale of a daily supply of over 700,000 quarts of milk for Philadelphia, besides many thousand quarts for small cities, the total farm value of which could be conservatively estimated at \$25,000,000 annually. At these conferences, milk distributors and manufacturers of dairy products purchasing milk in the district are invited to attend. The Interstate Milk Producers' Association is represented by an executive committee of seven men. At each meeting, a temporary chairman for the day is appointed. The group which asked for the conference is first called upon to explain the aspects of the market situation which caused them to ask the other group to take such action. Then representatives of the other group are asked to explain their attitude toward the situation. If the farmers feel that the time has come for the increase in farmers' price, they state the reasons for asking for the change. If on the other hand, it is a time when the dealers feel that the market situation demands a reduction in the price, they state those reasons. Then the opposite side states its reasons for differing from, or perchance coinciding with, the position of the group asking for the conference.

One group or the other usually early in the conference makes a definite proposition as a basis for future understanding. The groups then separate to discuss the proposal. Reassembling, the proposal is either rejected or accepted by those present. If rejected either whole or in part, the conference continues.

Such a conference or series of conferences may last all day while the

various situations are developed and explained. If it is apparent that the groups cannot agree as to an understanding for the future, the differences are referred to the arbitrator for adjudication.

Dr. Clyde L. King has acted as an arbitrator by special request of all parties concerned since the early days of the plan. His services are now called for only at infrequent intervals. The policies of the conference are well established, the principles underlying a permanently fair price arrangement well understood and a basis of mutual confidence developed through the regular fulfilment by both sides of the agreements so made.

In order that this arbitrator may be at all times in full possession of the necessary facts on which to base a fair decision, the milk dealers regularly supply him with information as to their operations and the producers keep on hand such information as (a), the cost of cows, feed and labor, (b), the value and amount in international markets of milk and all dairy products and (c), the price of milk in surrounding fluid milk territories.

A decision having been arrived at, it is made public with the reasons therefor. The verbal understandings so made are scrupulously kept by all parties. No formal written contract has ever been needed. A memorandum may be made covering the details of the arrangement, as, for instance, that which explains the so-called Philadelphia surplus selling plan, which has been responsible for the gradual elimination of seasonal surpluses as mentioned in a paragraph subsequent.

GUIDING PRINCIPLES

In arranging prices the following factors are considered:

(1) The cost of producing milk and the returns from milk production as distinct

from the production of other farm products. The test is, after all, the output of milk as compared with the output of other farm production. The cost of producing milk cannot, for long, get out of line with the cost of alternative crops or products.

(2) Equal consideration is given to the market. Comparative market values for important dairy products and the trend in supply are considered. The farmers, furthermore, do not accept the principle that the law of supply and demand is inexorable and they can do nothing about it. Through suggestion and method of price determination they influence the supply and help the dealers influence demand and increase the consumption of their products.

(3) Throughout eight years, stability of the consumers' market has been the first consideration. The farmers have looked upon good-will of the consumers as their greatest asset.

The farmers have believed that collective bargaining has better met their market than co-operative ownership and management of milk distribution, as undertaken by groups of farmers in some other markets. They believe that farmers are as good business men as any other group. The important cities in the Philadelphia Milk Shed have already established distributing plants under efficient management capable of milk distribution at low unit costs. So the farmers settled down to getting every dollar that they possibly could for the sale of their milk.

The farmers have encouraged responsible dealers who could do business economically, and they have discouraged irresponsible dealers and those who could not have low unit costs in their plants. The farmers have not accepted the point of view of many milk dealers that it was none of the farmers' business what the "dealer's spread" was and that it was none of the dealers' business what the cost to the farmer was, and that one should not interfere

with the other. They have felt that the whole process from the cow to the consumer was part of the business of everyone concerned, including the consumer. The farmers have, therefore, insisted that the "spread" to the milk dealers be kept as low as was consistent with the cost of competent milk distribution. For this reason the farmers have adopted the policy of getting the dealers to furnish confidentially to an arbitrator information as to their individual costs. Through this information the consumers' interest has been safeguarded (1) in trying to keep the milk low in price by a low "spread," (2) stable in price, and (3) of as high a quality and standard as possible, without unnecessary seasonal variations. To put it in a sentence, those responsible for the milk industry in Philadelphia feel that milk producing and distributing is a *service*. They are selling *service* as much as a product. It is part of their business to improve the *service*. It is also essential to their business to improve the product. This is a service age.

It has been said by some that the success of this conference method of arranging prices was due to unusual personalities among the leaders of the industry in Philadelphia and that it could not be universally applied elsewhere in the dairy business and in other lines of business endeavor. Were this a one-city proposition, this might, perhaps, be said, but the plan, with variations, is working equally well in other markets: for instance, in Baltimore, Md.; Pittsburgh, Pa.; Detroit, Mich.; Hartford and New Haven, Conn.

GROWTH OF ORGANIZATION

The officers of the Interstate Milk Producers' Association early recognized that it must be more than a simple bargaining organization in order

to perform its proper functions. There has been a gradual development in membership, over 20,000 farmers from 40 counties having joined the Association by 1924. At the present time the Association has a force of eight fieldmen who check the weights and tests upon which its members are paid for milk, and also take care of local problems under direct supervision of the central office.

PHILADELPHIA SELLING PLAN

Following the universal practice the dairy farmers supplying Philadelphia had always been accustomed to let nature very largely arrange their farm practices, producing most of the year's supply of milk in the spring and summer, rather than at such times and in such quantities as the consuming public demanded. In other words, in many sections supplying Philadelphia there were five cans in the summer for every can produced in the winter, though the public uses very nearly the same amount of milk each month in the year. A selling plan² was devised

² The reader may be interested in learning how this selling plan operates. The following quotation from Memorandum of Conference of October 3rd, 1921, explains it briefly:

Each producer shall be credited with the amount of milk delivered by him during October, November and December, 1921. The average production of these three months shall be known as the "basic quantity." These amounts are to be posted at the Receiving Station and duplicate copies sent to the Interstate Milk Producers' Association.

During the following nine months he will receive the basic price for the following percentages of this amount of milk:

January.....100%	June.....100%
February.....100%	July.....110%
March.....100%	August.....110%
April.....100%	September.....115%
May.....100%	

Additional milk produced during these months, if any, to be paid for on the following basis.

A committee of three, one from the producers, one from the manufacturers and one from the

which has now been effective for four years. Under this the seasonal surplus

dealers, will check up, each month, the average price of New York 92 Score solid packed butter, as published by the U. S. Bureau of Markets for that month and immediately inform all concerned what this price may be. Payment for all additional milk as above determined to be made according to the following schedules.

No. 1. Producers who have been regular patrons of a receiving station, or regular shippers to a dealer, who have established a basic quantity during October, November and December, 1921, are to receive the basic prices for basic quantity. For an amount of additional milk less than or equal to the basic amount, 92 Score New York Butter plus 20 per cent. For all additional surplus above an amount equal to basic quantity, a price based on 92 Score New York Butter without the 20 per cent premium for the months of January, February, March, April, May and June. During July, August and September all shippers shall be paid for additional milk a price based on 92 Score New York Butter plus a premium of 20 per cent.

No. 2. A. All former patrons at a receiving station or direct shippers to a dealer who make no milk through October, November and December and who, therefore, established no basic quantity, if they resume shipping in January, February and March, shall be paid a price for all their milk based on 92 Score New York Butter plus a premium of 20 per cent. This plan to continue until October 1st, 1922.

B. If they fail to resume shipping until April, May or June they shall be paid a price based on 92 Score New York Butter for the months of April, May and June. For July, August and September the price to those shippers shall be 92 Score New York Butter price plus a premium of 20 per cent.

No. 3. Men starting in the dairy business and who therefore have not established a basic quantity and desire to start to ship milk during any one of the first nine months of 1922, shall be allowed to establish a basic quantity by calculating one half of the daily average of the amount produced by such shippers during the first thirty days of shipment and thereafter counting this as the basic quantity during the remaining months.

No. 4. In case of tenants changing from one farm to another or farm owners selling out and repurchasing a farm elsewhere and who by this procedure change buyers of their milk, it is definitely understood that the basic quantity established goes with the cows.

No. 5. Special cases of one or more producers changing to new buyers are open to agreement

formerly most heavy during May and June has been almost eliminated through careful planning on the farm.

between such producers, buyers and Interstate Milk Producers' Association.

This agreement covers all points in the territory. Any of the three parties interested, that is the distributors, manufacturers and the Interstate Milk Producers' Association, reserves the right to ask for a conference to consider the situation if it feels its interests are being jeopardized thereby.

Example of the calculation of a Basic Quantity:

During the past year, for instance, the production in the Philadelphia Milk Shed has not varied more than 12 per cent at any time during the year.¹

Farmer A produced

2,100 pounds milk in October

2,000 " " " November

1,900 " " " December

Average for three months 2,000 pounds.

If 3,000 pounds were shipped in May, or any other month, this would represent 2,000 pounds basic milk, to be paid for at the maximum or basic price and 1,000 pounds surplus, to be paid for as provided in the foregoing agreement.

¹ Proportion of Milk Produced by Farmer which was Sold at Basic Price.

(Adapted from Survey, "Marketing Milk in Philadelphia," U. S. Department of Agriculture, 1924.)

	1920 (corrected)		1921 (corrected)		1922 (corrected)		1923	1924
January.....	85	85	84	84	89	89	87	88
February.....	82	82	84	84	88	88	88	90
March.....	76	76	75	75	82	82	80	86
April.....	75	75	69	69	79	79	80	86
May.....	68	(61)	59	59	67	67	70	77
June.....	65	(58)	64	64	70	70	70	76
July.....	63	(56)	78	(70)	79	(71)	80	80
August.....	67	(63)	74	(67)	77	(70)	80	80
September.....	67	67	74	74	85	(72)	80	82
October.....	100	100	100	100	100	100	100	100
November.....	100	100	100	100	100	100	100	100
December.....	100	100	100	100	100	100	100	100
Average for year....	78	(77)	80	(78)	85	(82)	86	87
Average for first 9 mo.....	71	69	72	(71)	78	(76)	81	83
Average for first 6 mo.....	75.1	73	72.5	72.5	79.1	79.1	79.1	83.8

For each year two columns are shown. The first column was obtained by dividing the combined total monthly receipts of milk, purchased by the leading dealers in Philadelphia (constituting from 60 to 70 per cent of the total supply), into the combined total quantity which these dealers purchased at the basic price. This shows what percentage of the total quantity was bought at the basic price. For some of the summer months, however, this is not a fair comparison. During 1920, for the months of May, June and July the basic amount allowed was 110 per cent of the amount established the previous fall and for August, 105 per cent. Likewise for July and August for both 1921 and 1922, 110 per cent was allowed, and for September, 1922, 115 per cent. To place these months all on a comparable basis, they were reduced to 100 per cent, that is, the basic amount for the month was reduced 5, 10 or 15 per cent according to the month, and the resulting figure divided by the total amount for that month. The second column (corrected) shows the figures which accurately reflect the change taking place. It will be seen that for the average of the year or for the average of 6 or 9 months the basic amount has proportionally increased, with a corresponding decrease in the surplus. This is particularly significant for the months of April, May and June—the months of large surplus. For each of these months the corrected figures for the years 1922 and 1923 show marked increases over the years 1920 and 1921. The data show clearly the effect of the basic-surplus price plan upon the Philadelphia area—that it is tending to make the supply of milk more uniform for the whole year, taking out a part, at least, of the summer surplus.

It was early found that there were apt to be wide variations from time to time between the price paid for farmers' milk in two different cities which obtained their supplies in contiguous territories and in some cases in the same territory. After careful analyses of the milk supply of the Philadelphia Milk Shed, adjustments were made in the prices in the smaller cities and towns within this Shed so as to keep a proper relationship or differential between the prices in the smaller towns and the price in Philadelphia. It was found that if this differential was fixed at approximately the freight rate to Philadelphia, a mutually satisfactory arrangement could be reached. With certain variations and changes from time to time, this policy has been pursued and is now firmly established as part of the practice of the industry in the Philadelphia territory.

PHILADELPHIA INTERSTATE DAIRY COUNCIL

Prominent dairy leaders in the "Interstate" and among the Philadelphia distributors gradually realized that there was a social obligation as well as a business opportunity, which both producers and dealers were neglecting. Milk has long been recognized as a vital human food, but the recent discoveries in the field of nutrition emphasize much more fully the great importance of milk as an all-important factor in the human dietary. Out of this mutual interest and concern has grown the Philadelphia Interstate Dairy Council, an educational organization financed by the industry and managed by an executive committee representing producers and distributors, acting in conjunction with an advisory committee on which are representatives of the various health, welfare and educa-

tional agencies which are, for one reason or another, particularly interested in the milk problem of our large cities.

The Philadelphia Interstate Dairy Council started operations in January of 1921. At the present time it has forty-three employes and does educational work in Philadelphia and other cities and towns throughout the district. The new health program of the American health organizations includes milk as one of the eight important health rules, so the Council recognized that it could best serve the purpose for which it was formed by co-operating in this modern health movement and preaching the food value of milk in its proper relationship with the other health rules, as well as the proper place of milk and its product in a well-balanced diet as recommended by authorities such as Dr. E. V. McCollum and others. A broad platform of this kind had enabled the Council to co-operate extensively in the school health program. During the past year it gave over \$6,000 worth of free milk for the use of undernourished children in special nutrition classes in Philadelphia, Lancaster, Chester and Reading. Lectures on foods have been given before parent-teacher meetings, woman's clubs, and similar groups, while cooking demonstrations have been given to groups of mothers wherever they could be conveniently assembled.

Recognizing the importance of the dramatic presentation of its message, a force is regularly employed to co-operate with the schools in the presentation of health plays by the children before the school assemblies and groups of parents and interested friends. A general publicity bureau is regularly maintained and furnishes publicity material through the press, motion

pictures, fairs and other worthwhile agencies.⁴

QUALITY IMPROVEMENT AND RESULTS

The Dairy Council early realized that it had an obligation to society in attempting to educate the farmers with regard to the importance of improved sanitary standards on the farms, so that the public could be guaranteed that Philadelphia was getting the very best possible quality milk supply. A Quality Control Department was established with at first one worker. This work grew until there were last year four men making tests of the farmers' milk at country plants and holding meetings with groups of farmers wherever they could be successfully assembled. During one year over 25,000 farmers were reached through these meetings. A year ago it was felt that this educational work had now proceeded far enough so that the industry itself could set up minimum standards for the production, collection and distribution of milk voluntarily enforced upon its members and thus guarantee to the public still further the quality of the product. This pioneer quality improvement work is unique.

The members of the Interstate Milk Producers' Association, at its annual meeting in 1923, agreed to be governed by a set of regulations which had been submitted to them in advance for approval. All co-operating dealers agreed to the same procedure. The Quality Control Department of the Dairy Council was designated as the enforcement agency. Its force was increased at once to ten men. Before

June, 1924, 12,000 temporary permits to ship milk were issued to farmers. By November 1 over 12,000 farms had been visited and their proprietors given instructions with regard to improvements needed. Already after six months operation of the new system of voluntary sanitary control, a number of farmers have permanently discontinued shipping because they would not meet the requirements. A somewhat larger number have voluntarily done so because they could not rearrange their barn and dairy in a satisfactory way. More than 2,000 new milk houses have been built. More than 25,000 new sanitary milking pails are being purchased and 15,000 barns are regularly whitewashed for the first time.

The co-operating milk distributors, too, have not been unmindful of their obligations toward quality improvement. All of their country plants are regularly inspected by the same force. Improved mechanical can washers are installed as regular equipment. A few plants have been condemned and abandoned because of such items as an inadequate water supply or antiquated construction.

Definite results of the quality improvement work are as yet not fully apparent. Such a movement has a cumulative value. Its progress must necessarily be like that of a snowball as it gathers momentum in an aroused supporting public opinion in the country communities, and in a public confidence in the city.

Results already attained, however, give ample evidence of the soundness of the principle of self-determination and self-government applied to the regulation of an industry, and what is far more significant, they justify the confidence that was placed in the farmers and dealers to carry out the provisions of the regulations in their daily

⁴ SUMMARY OF DAIRY COUNCIL WORK FOR 1924

Window exhibits.....	244 days
Literature distributed.....	600,000
Moving picture attendance.....	500,000
Attendance at lectures, cooking demonstrations, etc.....	210,000
Attendance plays and talks.....	323,000

work. These provisions entail a considerable additional financial burden for many farmers, but we hear little or no complaint. Occasional non-co-operators, when the facts become known, soon feel the weight of an indignant public opinion. Helpful with suggestion and actual demonstration, sympathetic with difficulties, patient with ignorance, fair in judgment, the fieldman of the Dairy Council can count practically every farmer his friend. Through these relationships the Dairy Council gains 100 per cent loyalty and can number as its "inspectors" the operator of almost each and every farm supplying the city.

Contrast the spirit of this relationship with that under a system of public milk inspectors under the jurisdiction of a city board of health, no matter how wisely regulated or how leniently administered.

It must be recognized that the vital factor in the success of this quality improvement campaign has been the Interstate Milk Producers' Association. The members through eight years of marketing experience had become convinced that such a program was fundamental to a sound marketing system. They recognize the right of the consumer to demand a quality product and that the opportunity to produce such a product is theirs only in so far as they are willing to and do comply with the highest standards of quality that are possible under ordinary conditions of production and distribution. The quality improvement work cannot be considered in any other light than that of an integral part of the whole Philadelphia milk marketing idea, as worked out by the Interstate Milk Producers' Association with the co-operation of the distributors to whom its members are selling milk and with the advice and guidance of Dr. Clyde L. King.

At one milk plant last year there was sometimes as much as two to three thousand pounds of milk rejected daily during the summer period because of inadequate cooling on the farm. This year, after the farms had all been visited, the rejection did not amount to more than two hundred pounds. Buyers are noticing better milk from all sections as indicated by the various ordinary tests by which the sanitary quality of milk is judged.

SOME PRESENT DAY PROBLEMS

Many problems remain to be solved. Concrete roads and insulated glass lined tanks on trucks and railroad cars are helping to reduce the cost of transportation, helping to reduce losses due to waste and spoilage in transit and when increased population and consumption requires it, are aiding to enlarge the Philadelphia Milk Shed. The erection of new concrete roads and the change in price relationships between fluid milk and milk products is bringing about some relocations and readjustments of plants and truck routes. The increasing demand for higher grades of milk, showing an increased discrimination in milk buying on the part of the public, creates a new problem of grade standardization that awaits a more complete agreement. These problems are already being studied. The industry is now so organized that it can care for them.

RESULTS

It is not difficult to show the results of the co-operative activities of the fluid milk industry in Philadelphia, for we can get comparable figures on which to base a comparative estimate. It has done certain things denoting real social and economic progress, which are recognized by those familiar with the situation. Philadelphia has been receiving a satisfactory supply of

milk at a lower price to the consumer than that in corresponding markets in other great centers. During the same period the farmers have received as much or more than the corresponding price received by farmers in the same group of comparable fluid milk markets. The quality of milk from every standpoint—palatability, food value, and sanitary standards—has been greatly improved. The consumption of milk has shown fairly satisfactory increases year by year.

If we should strike a balance and endeavor to determine what are the net results of the last eight years' development of the Philadelphia fluid milk industry, the resultant figures that re-

main on the right side of the ledger are immediately divisible into two classes: (1) the immediate financial returns, fair prices to producers, a satisfactory financial situation for the distributor and low prices to consumers; and (2) a definite practical method for an industry to permanently solve its inter-related problems and at the same time discharge its obligation to society,—in the case of the producer and distributor of the morning's milk, a particularly solemn responsibility.

This experience is at once an answer to those who would question the fairness and stability of the present economic order and a challenge to other groups to give it an honest tryout.

Supply and Price Interactions in Farm and City Products

By H. A. WALLACE

Editor, *Wallace's Farmer*, Des Moines, Iowa

MANY serious-minded people in this country cannot understand why farmers in times of depression are so easily led to believe that price fixing of farm products may be a good thing. Economists firmly grounded in the teachings of Smith and Mill instinctively feel that price fixing is imprac-

tical and even though it may work for a short time, in the long run it is almost sure to bring disaster to those who thought they were being helped.

In this article the interactions of supply and price will be examined for corn, hogs, potatoes, pig iron and coal for the period 1882-1913. This study

TABLE I—PERCENTAGE DEVIATIONS FROM THE TREND

Year	Corn		Potatoes		Hogs		Pig Iron		Coal	
	Price	Yield	Price	Yield	Price	Yield	Price	Yield	Price	Yield
1882.....	6	2	-2	1	36	-2	8	6	7	2
1883.....	-3	-5	-23	19	13	-15	-6	-2	-6	5
1884.....	-16	9	-26	16	-6	1	-7	-18	-13	3
1885.....	-19	12	-12	5	-19	-3	-11	-26	-21	-11
1886.....	-6	-6	-6	1	-7	-2	4	0	-22	-13
1887.....	17	-14	41	-22	12	-12	27	8	31	-3
1888.....	-8	12	-15	11	12	-10	13	3	4	7
1889.....	-21	15	-24	6	-17	-3	13	16	9	-1
1890.....	44	-12	63	-23	-20	17	20	32	14	5
1891.....	17	14	-24	27	-10	11	10	11	14	9
1892.....	14	-3	41	-18	52	-35	1	17	9	11
1893.....	7	-6	27	-6	22	-32	-7	-15	10	7
1894.....	33	-19	13	-18	0	-1	-23	-26	0	-5
1895.....	-27	8	-44	30	-14	-7	-15	-2	-9	1
1896.....	-39	15	-41	16	-26	-7	-20	-17	0	-6
1897.....	-26	-3	12	-19	-23	5	-33	-13	-22	-9
1898.....	-20	-0	-16	-8	-26	21	-33	-2	-30	-6
1899.....	-18	1	-23	12	-12	5	19	4	-13	1
1900.....	-6	0	-16	-4	0	9	17	-3	5	0
1901.....	55	-34	46	-24	14	17	-4	5	5	1
1902.....	1	5	-12	10	20	-7	28	9	0	-4
1903.....	2	-1	13	-5	-14	1	12	3	36	7
1904.....	2	3	-18	22	-18	8	-19	-12	-12	-2
1905.....	-8	10	9	-6	-9	6	-4	14	0	3
1906.....	-14	15	-11	9	8	-4	12	18	8	2
1907.....	6	-2	6	1	-27	7	30	14	8	12
1908.....	20	-1	20	-10	-6	8	-7	-34	0	-8
1909.....	10	-4	-10	10	30	-21	-4	2	-3	-4
1910.....	-13	5	-7	-3	16	-23	-5	4	-3	1
1911.....	7	-10	33	-17	-9	6	-11	-14	-3	-4
1912.....	-19	11	-17	17	10	-10	-4	4	-3	0
1913.....	10	-12	14	-7	14	-11	6	5	4	3

brings out in concrete quantitative fashion what farmers have been instinctively feeling for the past 60 years: that there is one law of supply and demand for city products and another for farm products.

The table on p. 243 gives percentage deviations year by year for both price and yield for the three farm commodities and the two basic commodities used in manufacturing. In the case of corn and potatoes the deviations are from a curved line of secular trend as figured by H. L. Moore and presented in the February, 1921, issue of the *Quarterly Journal of Economics*. The yield deviations for pig iron and coal are also from the same source. I have myself figured the price deviations of pig iron and coal, using the same type of secular trend as a base. In the case of hogs I have used the winter packing figures of the *Price Current Grain Reporter* and have used for the secular trend two straight lines, the two overlapping in the decade of the nineties and being united into one figure by a system of weighting. The final results are substantially the same as though a curve had been used.

Using the deviations as presented in Table I as a starting point, curved regression lines of the type $y = a + bx + cx^2$ were calculated for each of the five products. The price deviations were used as the dependent variable and the yield or supply deviations as the independent variable. The respective equations were as follows:

Corn:

$$\text{Price} = -2.05 - 1.26 \text{ yield} + .0157 \text{ yield}^2$$

Potatoes:

$$\text{Price} = -3.74 - 1.55 \text{ yield} + .0206 \text{ yield}^2$$

Hogs:

$$\text{Price} = -5.47 - .79 \text{ yield} + .017 \text{ yield}^2$$

Pig iron:

$$\text{Price} = 4.2 + .835 \text{ yield} - .01812 \text{ yield}^2$$

Coal:

$$\text{Price} = 1.35 + 1.29 \text{ yield} - .0375 \text{ yield}^2$$

Expressing these formulae in tabular form we get Table II. (See next page.)

It will be seen from Table II that a shortage of more than 25 per cent in the supply of corn, hogs or potatoes tends to raise the price by more than 25 per cent. There really was a strong tendency during the 1882-1913 period for small crops of corn, potatoes and hogs to sell for a greater total than large crops. The prices predicted from the curve of influence of yield on price correlate with the actual prices as follows:

Corn ¹.....	.77
Potatoes.....	.91
Hogs.....	.72
Pig iron.....	.57
Coal.....	.59

The outstanding feature of the situation is that with pig iron and coal the greater the production, the higher the price. Of course this is an economic absurdity. It cannot be true even though we have perfectly good figures for the years 1882-1913 to prove it. Of course the truth of the situation is that with most mined or manufactured commodities prices come first and supply comes second. In agriculture, supply sets the price. In industry, price sets the supply. Philosophically it was a statistical mistake to look on price as the dependent variable and supply as the independent variable in the case of pig iron and coal.

THE FUNDAMENTAL DIFFICULTIES

Forgetting the details of statistical method for the remainder of this article, we shall endeavor to point out the fundamental difficulties in the farm situation. In the first place in agriculture

¹ Please note that since these correlations are between predictions from the regression curves and the original price deviations, they must needs be positive in every case. Of course the regression curves for the agricultural products have a negative slope.

TABLE II

Deviation in Yield Per Cent	Deviation in Prices Indicated by Formulae for Yield Deviations				
	Corn	Hogs	Potatoes	Pig Iron	Coal
-42.....					
-40.....					
-38.....					
-36.....					
-34.....	59	42		-45	
-32.....	55	37		-41	
-30.....	50	34		-37	
-28.....	46	30		-33	
-26.....	41	27		-30	
-24.....	37	23	45	-26	
-22.....	33	21	40	-23	
-20.....	30	18	35	-20	
-18.....	26	15	31	-17	
-16.....	22	12	27	-14	
-14.....	19	9	22	-11	
-12.....	15	6	18	-8	-20
-10.....	12	4	14	-6	-15
-8.....	9	2	13	-4	-11
-6.....	6	0	6	-1	-8
-4.....	3	-2	3	1	-4
-2.....	0	-4	1	2	-1
0.....	-2	-5	-4	4	1
+2.....	-4	-7	-7	6	4
+4.....	-7	-8	-10	7	6
+6.....	-9	-9	-12	9	8
+8.....	-11	-11	-14	10	9
+10.....	-14	-11	-17	11	10
+12.....	-15	-13	-19	12	11
+14.....	-17	-13	-21	12	
+16.....	-18	-13	-23	13	
+18.....		-14	-25	13	
+20.....		-14	-26	14	
+22.....			-28	14	
+24.....			-29	14	
+26.....			-30	14	
+28.....			-31	13	
+30.....			-32	13	
+32.....				12	
+34.....					
+36.....					
+38.....					
+40.....					
+42.....					
+44.....					
+46.....					

there are millions of small units freely competing. Supply determines price. There have been no concerted efforts to determine the price first and then to mold the supply to fit that price situation. Possible exceptions to this rule comprise only a few minor commodities such as raisins and tobacco. Farmers find it difficult to follow in the footsteps of the industrialists in molding supply to price for the following reasons:

(1) There are a thousand times as many farmers producing staple farm commodities as there are industrialists producing coal, iron, etc.

(2) Farmers are separated by distance, prejudice and ignorance.

(3) The size of the supply of farm crops depends largely on weather and to a lesser extent on insects and diseases, over which very little control can be exercised.

(4) Farmers for the most part have a large number of middlemen between them and the consumer and these middlemen feel that it is their function to determine farm product prices rather than the farmer.

(5) There are many types of farmers producing the same commodity. Certain poor tenant farmers and owners with large mortgages may be willing for a time to sacrifice completely a decent white man's standard of living in order to produce and sell on a demoralized market at far less than a reasonable cost of production. Imagine the chaotic price situation in pig iron if each workman had a few tons to sell and if he sold them on the basis of his individual necessities rather than the general pig iron situation.

Industrial concerns from time to time have met many of the farm difficulties just enumerated. In new businesses there have been times of cut-throat competition with the weaker concerns setting the pace and bringing ruin upon themselves and, temporarily, hard

times on the entire industry. But in every industrial situation of this sort there is eventually stabilization accompanied oftentimes by merging of big corporations. There is careful cost accounting and usually tacit price agreements. This is not the free competition visualized by the classical economists. Nevertheless, the "live and let live" policy adopted by most stabilized industries is looked on as being beneficent and better for all concerned than free competition.

STABILITY FOR FARMER

The farmer is still engaged in cut-throat competition with his fellows. He gambles continually on weather, pests and prices. For all his risks, the capital he uses has never brought the same rate as capital employed in industry, and his labor has not brought the same return per hour as labor employed in industry. And yet the hunger of men for land and for the seeming independence of the great open spaces has been so great that we do not lack for farmers in the United States. Moreover, there has been the lure of a possible speculative profit as a result of the higher land values.

The true farmer is no business man and has no desire to be one. His great joy is and should be in the efficient production of high quality crops and livestock. Farmers of this sort can furnish the backbone of a fine and enduring civilization, provided they are not unduly harassed by wildly fluctuating prices of farm products and farm land. They need the same price certainty in their business as industry has. A comprehensive type of insurance must be worked out to take care of the weather hazard. Prices must be used more and more to determine the volume of the supply instead of the reverse as we have it today.

Now it is conceivable that both the

crop insurance situation and the price situation may eventually have to be handled under government supervision. The people who are sticklers for things as they always have been can see nothing serious in farmers producing under one type of supply and demand, whereas industry produces under another type. They do not realize that the farmers are 100 years behind labor and capital in their organization and that there is no immediate prospect of farmers closing up the gap. None of the myriads of farm co-operative organizations have been able to work out as effectively as the pig iron and coal people the problem of letting price determine the volume of production.

Producing food is handled today on a

totally different economic theory than producing industrial products. As to whether a satisfactory agricultural civilization can be built up under such a situation is doubtful. The tendency for the people in the cities will be to avoid any careful study of this problem. They are interested in an ever more powerful industrialism, even though it may mean peasantry on the farms.

Individuals are concerned only with the possible events of the next 50 or 60 years. Governments should take into account the possibilities 100 or 200 years hence. Can the government of the United States afford to let our farmers battle in their own inadequate way with the double hazards of weather and price?

Fitting Production to the Market

By ROBERT J. McFALL

Massachusetts Agricultural College

THE business of farming, even under the best of management, is unable with complete success to adjust its production to the changes in market demand. The extreme influence of the weather and the long time necessary to alter a farming program make the quantity of agricultural production very inelastic in its response to market conditions. Fortunately for the farmer, the fluctuations in consumption of food products are not so severe as are the variations in demand for some other less constantly necessary commodities. Nevertheless, recent history has shown emphatically that there are real changes in the effective demand for our farm products, not only as regards total quantity of all products, but also shifts in demand from one product to another and from one quality or class of product to another. Many of these changes, moreover, are sufficiently slow in their movements to make corresponding modifications in the agricultural production program at least partially possible. The near future also promises changes in the demands for food products which may be anticipated and met by changes in production.

EXPANSION THROUGH ACTUAL DEMAND

One of the most important principles in marketing is the desirability for the programs of production and aggressive sales to meet the real demands of the market. In many industrial lines new demands can be constructed and old ones greatly enlarged through advertising. In such successful cases the potential demand was in existence, as

many unsuccessful sales campaigns testify. When we turn our attention to the market for farm products, particularly foods, we find less true opportunity for building up increased total demand through advertising and related marketing policies. One food may capture the market for another food, but there is little chance of stimulating a demand for more food. As a nation we are already the heartiest eaters on the globe. The "submerged tenth" may be undernourished, but new demands of consequence cannot readily be successfully cultivated in that quarter. And there does not seem to be sufficient tendency toward overeating in the nation to afford a successful basis for any material expansion in the per capita consumption of one food excepting at the expense of the sale of another food.¹

If it be a fact that attempts to increase demand for particular food products reduce themselves to practically nothing else than an expensive form of competition between farmers to capture the same demand and the same dollar, it must necessarily be that this is the wrong way to attempt to fit together the production and the market. The better way is for the producer to study his market and shape his production to meet the existing demands, limiting his advertising program to the direction of attention to the desirable products.

A few years ago it was charged against our exporters of merchandise that they failed to study the foreign

¹ Taylor, A. E.; "Consumption, Merchandising and Advertising of Foods," *Harvard Business Review*, April, 1924, pp. 282-295.

demand and attempted to ship merely a surplus of goods which they happened to have for sale. An example was given of the shipment of collars marked in inches to South America where only the metric system was known. This was a "horrible example" used by the teachers of foreign marketing. It would not be difficult to find many such examples today in the field of domestic marketing of farm products. It is hardly an exaggeration to say that the main call for marketing advice since 1920 has been for help to dispose profitably of farm products produced without any real idea of what the market wanted in quantity and quality. The farmers have produced what it suited their personal notions to produce and then called for marketing panaceas to help them dispose of their products at a profit.

The idea is slowly gaining ground that, especially in agriculture, good sense dictates that the demand must first be ascertained and that the best efforts must then be made to meet the quantity and quality called for in that demand. It will be difficult ever to make the quantity of production meet the demand with any great degree of nicety, unless the weather can be foretold with an accuracy unknown at present. Relative demand for the various farm products can, however, be met more closely than has been the case in the past and quantity adjustments are by no means impossible. The quality of products and their preparation for the market are continuously being fitted more closely to the true demand. The U. S. Department of Agriculture is doing excellent work in presenting to our farmers the demands of the foreign market. The Massachusetts Department of Agriculture is doing some valuable work in ascertaining the facts regarding its local market demands and presenting them to local farmers.

These are but samples of real effort directed to the solution of this general problem.

The real basis for an expansion of outlet at home for farm products lies in the increase in our population. About 1,500,000 more mouths are added to the consuming population each year. The resulting increase in domestic demand bids fair to absorb the equivalent of all our food production. In fact, as already noted elsewhere,^{1a} for two years before the war and again this last year the home demand has absorbed somewhat more food than the domestic production; exports have been more than offset by imports. Even when imports are disregarded, only 17 per cent of our crop area was devoted to the foreign market on the average during the years 1914 to 1922.² Since this period includes a number of years of very great export, it may be assumed that nearly 90 per cent of our farm land today is devoted to the home market. On the whole, during the past twenty-five years the growth of our population has exceeded the rate of increase of our farm products.

RATIO OF FOOD PRODUCTION TO POPULATION

In view of the very pessimistic ideas so popular of late on the possible early shortage of the food supply to meet the needs of our growing population, it is necessary to insert a few words of caution here to avoid a possible misunderstanding. It is quite unsafe to draw the ordinary conclusions from many of the data frequently used for such a purpose. The fact that agriculture has already spread itself over most of the best land in the country does not prove that expansion of food production is near an end. Nor does the failure of crop area and livestock

^{1a} P. 129, *infra*

Agriculture Year Book, 1923, p. 457.

population expansion to keep pace with the increase of the human population prove a sure decrease in the per capita food supply. Crop acres and livestock population statistics are poor indexes of food production throughout a long series of years. We have pointed out elsewhere that the French meat production about doubled from a very slightly increasing cattle population in a period before the war. Food production has more nearly kept pace with population growth in the United States than popular indexes of the situation would indicate. Dr. L. C. Gray and collaborators have shown that by adopting even the average productivity of the lands in Germany, France, Belgium and Great Britain a population of 350,000,000 people could be maintained, or, if we cropped as intensively as Germany, and adopted her prewar standards of living, which were almost equal to our own in the per capita use of calories, we might possibly feed 574,000,000 people.³ As we have already shown in the pages of *The Annals*,⁴ it is highly probable that other factors limiting our population growth will be more rigid than the one of food supply. Dr. Raymond Pearl accepts such a possibility and sets a limit on the probable population of the country of less than 200,000,000.⁵

Such highly credible estimates lead us to conclude that it would be physically possible, even with our present knowledge of agricultural technique, to expand our food production more rapidly than the domestic demands are likely to increase. Nor is there any real proof that such an increase would, if conducted gradually, cause an unwonted increase in the cost of the products. The readiness with which the

nation's farms developed their output during the war with millions of men under arms and the factories out-bidding for the labor that was available, shows the present potential capacity for expansion of farm production. However, there are other reasons which lead us to suppose that the expansion of farm output will tend to lag behind the increase in the domestic demand and that, accordingly, the home market will be the main one to which our farmers must cater. These reasons are based upon factors which we anticipate will control our international trade.

FOREIGN MARKETS AND HOME EXPANSION

The whole matter of international trade is more intricate in its inner spurs to activity than is sometimes supposed. Why is Denmark an exporter of food-stuffs and England an importer? British farming lands are superior to the Danish and England was a leader in agricultural technique when Denmark was just thinking of the possibilities of modern farming. In the last half century the agriculture of the one nation has progressed rapidly, that of the other has declined markedly. The reason lies not in the direct physical possibilities of farming in the two countries, but in the balanced forces of international commerce and the many intricate factors which actuate these forces.

It is an accepted fact in the science of commerce that trade cannot move in one way alone. In common thought this elementary law is often neglected. Exports necessitate imports.

It is just as true that when a nation develops its industrial and commercial life to the point where a foreign market is necessary to afford an outlet for full-time activity, a large place in such foreign markets will be held by newer countries who are in a position to ex-

³ *Agriculture Yearbook*, 1923, pp. 497-498.

⁴ *Annals*, March, 1924, p. 257.

⁵ Pearl, Raymond. *The Biology of Growth*, *The American Mercury*, Nov., 1924, pp. 293-305.

port food and other agricultural raw materials. The only possible result is that the industrial nation must accept farm products in return for industrial goods and commercial services. England has chosen to develop her industrial and commercial life. The choice was thrust upon her by natural resources and other economic forces. Accordingly, so long as there are lands specializing in farming and so long as it is profitable to expand the output of the industrial "machine" to the point where these agricultural lands must afford a market, just so long will a nation such as England be a food importer.

Nations such as Denmark and the Argentine, which have practically no power and other essentially industrial raw materials, must expand their farm exports, if they expand commercially at all.

We have spoken of foreign lands, partly to make more clear the foreign situation, but largely to illustrate more clearly the possibilities in our own position. The greatest single factor which determines what elements will be most important in the outside commerce of any country is the comparative ability of that country to supply various goods and services. Here the primary comparison is not between countries. It is strictly a domestic comparison. A nation supplies those things for export which it can supply more effectively than other possible claimants for export. The immediately determining factor in pushing one thing at the expense of another is the economic organization of the country. Back of that are natural economic facilities and raw materials.

The United States is peculiarly well supplied with natural economic advantages for an expansion of the industrial and commercial side of our life. It is a question if any other nation has natural advantages which can equal ours in this

direction. Many other nations are so situated that agriculture is their most profitable opportunity. Our farm resources are as yet more magnificent than many pessimists allow, but they are overshadowed by our opportunities in other directions. Moreover, even with equal national opportunities for expansion between farming and urban industry, the latter would take the lead, for it offers the best outlet for the organizing ability of our men of business genius.

CATERING TO HOME DEMANDS

We are accordingly driven to the conclusion that our agricultural development will follow behind our industrial and commercial development and that the future offers a better promise for agriculture to cater to the demands of a prosperous population in our own land than to battle for a large share of the export trade in competition with the stronger forces of our industries.

This does not mean that all farm exports will disappear. Some particular commodities will have peculiar advantages on the world's markets. The questions related to particular products are discussed elsewhere.⁶ It does mean, however, that the main market demand which our farmers and their advisors should study is the home one rather than the more alluring one in distant lands. It is to this domestic demand that quantity, type and quality of our production should be adjusted. From the public standpoint the adjustment should include a surplus margin of safety to insure ample home supplies. The interests of the farmers probably suggest that the surplus should not be general but consist in those products, already discussed, which we may continue with profit to supply to the foreign market. On such a program a rate of expansion of agriculture com-

⁶ See page 154.

parable to that of the last census decade would be required.

It is probable that the home market will in the long run offer better prices than that of foreign countries. The studies of the National Bureau of Economic Research show clearly that the average level of income is much higher here than abroad. A study of the relation between prices and average incomes by communities doubtless would show that the areas with the highest incomes offered the best potential markets. Dr. Gray speaks of the "straw man," of the saving to the farmer of freight charges when any commodity changes from an export to an import basis.⁷ In its popular form this idea contains nil fallacies, but the rapid rise of domestic beef prices as compared with foreign beef prices in the decade before the war, when our export was disappearing, indicates that there is a very stout stick in the straw to support the "straw man." Whether or not the resulting higher prices bring greater profits to the farmers is another question.

The character of our home demand becomes of large interest if we admit that its expanding quantity will dominate our agricultural situation. The character in general consists in a desire for foods having the more appetizing qualities. As a nation we do not tend toward a monotonous diet, nor would we be at all satisfied with a diet merely because it contained sufficient calories. We are not heavy consumers of cereals, but we are heavy consumers of animal products in general, and fruits and fresh vegetables, which necessitate a large use of agricultural effort per calory in production.

MEAT CONSUMPTION

It has frequently been stated recently that our meat consumption is

⁷ See page 164, *infra*.

falling. This unwarranted assumption has been based upon too superficial study of the available statistics. Official data on per capita consumption of meat were started as late as 1907. This is unfortunate, for conditions have contained many disturbing factors since that time. Comparisons between the consumption in 1907 and in 1921 are misleading. In 1907 the production of animal products was above the average for the period and the purchasing capacity of the masses was comparatively high for the average of that year. In 1921 the livestock population was below its general trend and so also was the popular purchasing capacity. A much more enlightening comparison is between 1907 and 1923. In the latter year the livestock population was not so far above its normal as in 1907. The popular purchasing capacity was more comparable with the earlier period. In 1923 the per capita consumption of meat and lard was 183.4 pounds as against 179.8 pounds in 1907. The gain was all in pork products. During the earlier part of the period beef consumption was discouraged by the very rapid rise in price which occurred, when the western range became limited, attaching beef production more closely to true agriculture than to the "mining" of natural resources, and changing our export surplus to a net import. Moreover, beef consumption in particular has in the past few years been subjected to a great deal of antagonistic propaganda, part of which has been paid for out of public funds voted for the development of agriculture. Nevertheless, with all these handicaps, the amount spent on beef, its purchasing capacity deflated to a common level, has only decreased by 6 per cent from 1907 to 1923.

The actual increase in consumption of meats and fats in the last eighteen

years has come with about the same export in the two years and a declining number of livestock per capita of the human population.⁸ This fact shows clearly that the numbers of livestock are but a faulty index of the production of meat. As in France, the meat production per thousand live animals counted on the farms has risen markedly.

This very slight increase in consumption of meat products in the last two decades is superimposed upon what probably would be recognized as a very marked increase in the preceding half century, were the statistics available to picture the situation properly. In the nineties the number of livestock per capita of the human population was the same as in 1850.⁸ Statistics are not available to show the changes in meat production per thousand head in the flocks and herds, but ample evidence shows that during that period, with the passing of the light Texas steer and the greatly reduced slaughtering age of the typical meat animal, and consequent increase in proportion of animals slaughtered each year out of the herds, the production of meat has very greatly increased. This increase of production must almost certainly have been sufficiently great to allow for the export of from 10 to 15 per cent at the end of the period, and a material increase in the consumption.

The sugar statistics show clearly that the consumption of this enjoyable food has been very greatly increased.⁹ Statistical data are inadequate in other directions to show the situation very clearly. However, there has probably been an increase in the use of dairy products and of fresh fruits and vegetables other than the rougher potatoes. Modern storage and transportation facilities have given these latter prod-

ucts a wider use throughout the year.

All of these products, unless possibly sugar, call for a larger use of agricultural employment per calory than the coarser foods. This is greatly to the advantage of the farmer, for it increases the demand for his services. This expansion of demand for more elaborate services has corresponded roughly with periods of rising city wages. During the latter part of the last century the rise of wages was most marked. Unfortunately for the farmers, the great increase in farm production obscured this advantage at that time. During the last three decades the rise of wages has been less marked in comparison with the changed value of the dollar.

Nevertheless, over the ups and downs of the period, the purchasing power of wages has increased somewhat per unit of effort¹⁰ and some advantage thereupon has accrued to the farmer. Studies conducted in Boston¹¹ on the purchasing habits of consumers show clearly that the use of the foods requiring most agricultural energy per calory, such as animal products, are sought after more keenly among the better paid elements of the population. In other words, this underlying factor in demand is true in comparisons made at the same time among different elements of the population as well as during historical developments.

FUTURE OUTLOOK

What the future will bring forth in the development of popular prosperity is not fully revealed. The pessimists preach trouble from European competition. For the long run our magnificent natural resources and comparatively good economic organization lead us to be hopeful of increasing prosperity for the masses.

¹⁰ Douglas, Paul H.; unpublished Ms.

¹¹ Files of the New England Research Council on Marketing and The Food Supply.

⁸ *Agriculture Yearbook*, 1923, p. 439.

⁹ *Agriculture Yearbook*, 1923, p. 846.

Those particular farmers who keep up to the times, as well as those few who cater to an insistent demand from abroad for a limited amount of special products, should find prosperity ahead. It is not our part at present to suggest particular lines of effort which should be followed in such a catering to the real market demand. That is a perennial task for the farmers themselves and their advisors. We merely venture to suggest that such a task exists and that its careful performance will be of more value to agriculture than a competitive advertising and pushing of one food at the expense of another.

The individual farmers who follow the best practices in marketing and adjusting their supply to market demands will prosper. However, does such a program hold forth any hope to the masses engaged in agriculture? Classical economic teaching was called the "dismal science." Its teachings of the free working of competition leave no

room for real profit to any farmers but those whose methods are superior to those of the masses. If we could accept the theory that the possibilities in agricultural expansion were more limited than the probable increase of our population, we might anticipate a large unearned increment for the farmers in land values. However, farming will be better off the less it is mixed with land speculation and the less it is subjected to the competition of farm products turned out by land speculators. Assuming that the increase in land value will not have an over-weening importance in the near future, what of the prosperity of the masses engaged in progressive farming? It would appear that, since competitive forces operate much more slowly than is sometimes supposed and since the future domestic demand promises to call for a constantly expanding quantity and improved quality, the average farmer can look forward to the future with a fair degree of assurance.

The Place of Advertising in American Agriculture

By GEORGE F. JOHNSON

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THE possibilities of advertising agricultural products have come to the attention of farmers only in very recent years. The phenomenal growth of co-operative effort among farmers has been instrumental in this. With the exception of advertising pure-bred livestock and certain other specialties, very little advertising had been done in an extensive way until about the time of the World War. This was due partly to a lack of appreciation of the importance of advertising and partly to the very distinct limitations of any one farmer in advertising a product such as wheat, milk or eggs, produced on so many farms.

Another reason why the general use of advertising in agriculture was delayed has been the false conception that existed for some time relative to price control. There was the very definite motive among some co-operative marketing associations of exerting a type of monopoly power giving arbitrary price control. There was, of course, little place for advertising in a policy of this kind. Later developments, however, have amply demonstrated the fallacy of arbitrary price control and, as a result, emphasis has shifted to the stimulation of demand as a means of maintaining a profitable price. It is at this point that advertising came to the front.

For the purposes of the present discussion, consumable products produced on the farm can be roughly classified into the following three groups:

- (1) Those products which are produced in the form in which they are consumed, such as

fruit and vegetables, eggs and honey.

- (2) Those products which must be processed on the farm or in a local factory, often owned by farmers themselves, such as dairy products.
- (3) Those products which must undergo much processing in plants not usually owned by farmers, such as wheat, other small grain, and livestock.

In the first two groups, advertising is largely a matter of initiative on the part of individual farmers or of combined effort through co-operative organizations. In the third group, co-operation with the processors and other middlemen must be accomplished before extensive advertising can be effectively used.

PREREQUISITE OF SUCCESSFUL ADVERTISING

In order that farmers may do advertising on a large scale, an organization is necessary. This ordinarily means commodity organization and, even more than that, a purely co-operative organization to which each member contributes his support and from which each enjoys a common benefit. A second important essential is that of quality production and sale. This means standardization of package and label and payment to the growers according to the quality of the product produced. Standard grades are paramount in successful advertising. Unless the grades are kept uniform and dependable regardless of seasonal differences, the results of advertising will be uncertain, to say the least. A third

essential is that of knowing the market from both the geographic and seasonal standpoint. Several years ago the California prune and apricot growers made an investigation through their brokers before starting to advertise. What they found among other things was this: All classes of people eat prunes, though the larger per capita consumption is among the middle class. The largest per capita consumption was likewise found in the territory from the Atlantic Ocean to the Mississippi River and north of the Ohio River. Knowing these points, the advertising was timed and placed accordingly.

By a study of their markets, the cranberry growers found a heavy shipment in September which temporarily overstocked the market and had to be held by jobbers and wholesalers until the Thanksgiving or Christmas sales, thus causing extra expense and needless waste. This uneconomic condition was remedied by co-operation and advertising. Co-operation made it possible to hold back some of the shipments on the one hand and to stimulate the demand by advertising on the other hand so that more sales could be made during the pre-holiday season. The lemon and walnut growers had much the same problem and they have solved it in part at least by advertising new uses for their products during the "dead" seasons.

VALUABLE INFORMATION OF SURVEYS

Knowing what features appeal to consumers and what mediums will reach the desired consumer is also essential in effective advertising. A recent study of consumers' demands for dairy products in Philadelphia, made by the state and Federal government, revealed some rather interesting facts on advertising milk. Four hundred representative families were interviewed.

The question, "Where have you seen fresh milk advertised?" was asked, and the answers showed that 46 per cent remembered seeing some form of advertising. "Newspapers" was the most frequent answer, while "dealers' wagons" was second. Besides featuring names and trademarks, some dealers had slogans on their wagons and trucks that emphasized different qualities found in their milk. Billboards ranked third, street cars fourth, and movies fifth. The Italian and poor classes of people had seen the least of this advertising, while the well-to-do and wealthy classes had seen the most.

Another question asked was, "What do you remember about the advertising you have seen?" Two-thirds of those who had seen fresh milk advertised remembered some particular feature of the advertising. Food value was found to be the feature most often remembered; quality came second; the dealer's name, third; cleanliness ranked fourth; freshness, fifth; good for children, sixth; and price was mentioned only twice. It is rather significant that price was not more often remembered as a feature in advertisements.

An attempt was made to find out what particular feature of milk influenced the consumer most. Accordingly the consumer was asked what special features should be advertised. About 70 per cent of those interviewed offered some suggestions on this problem. Food value ranked first as the best argument in favor of using milk. Quality ranked second, cleanliness, third, and health, fourth. It is such information as this that farmers must gain if advertising is to be made most economical and effective.

ADVERTISING ONLY ONE FEATURE IN SELLING

It is a mistake to speak of advertising as something separate from other

features of marketing and selling. In agriculture, a successful advertising venture starts with the preparation of the seed bed and the seeding, with the pruning and fertilizing of the young tree, or with the breeding, feeding and care of the young animal. Once a high-grade standard product is produced, a good foundation for advertising is laid. Next, and very important, is the marketing and distribution of the product. This distribution must be timely and appropriate to meet the consumer's needs. The product must be placed before the consumer at the time, in the place, and in the form it is desired. Advertising, in other words, is simply one block in the great structure of selling. This applies in agriculture as well as other industries.

Before advertising can be used as extensively in agriculture as in other industries, it will be necessary to grade and standardize farm products much more generally than is being done at present. So long as farmers were producing commodities of all sorts and selling them without regard to grade, there was no place for a well-directed advertising program. This practice has changed rapidly during the past few years, however. Recent developments in standardization and sale by grade, stimulated by the Federal and state governments, are important steps toward higher standards in farm selling. For example, when fruit-growers in a given community or district co-operate, grade their fruit under state or Federal inspection, and then sell in standard packages carrying the stamp "U. S. No. 1" or other grade designation, it is not only possible to eliminate much waste and risk in marketing but also to use advertising to good advantage.

The mistake has been made of going into advertising haphazardly, without knowledge of the principles involved or of what a reasonable expenditure might be. As one co-operative association manager has said:

One cannot emphasize too strongly to a beginner in the advertising game that better results will be obtained by starting off on a small scale with a well-planned campaign than by starting off with a large appropriation and no plans.

A common practice among new co-operative associations, just starting an advertising venture, is to start with an appropriation large enough to put on an effective local campaign in one or two important consuming centers. This experience enables them to make more extensive campaigns in succeeding years without waste of effort and money.

All that can be done by advertising is by no means a settled point. A number of things have been accomplished by some of the larger co-operative marketing associations, especially those operating on the Pacific Coast:

- (1) It has been possible to enlarge the basic market;
- (2) To spread a distinct seasonal demand into a longer and more uniform demand;
- (3) To create consumer and trade preference for a particular brand of products;
- (4) To develop better packaging and other improved merchandising practices;
- (5) To promote the adoption of standard grades with the consequent development of new incentive for the production of higher grade products.

Scientific Nutrition and the Farm Output

By E. V. McCOLLUM

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THE science of nutrition is so new and its results are so little understood by the general public that it may fairly be said that it has scarcely been applied to farm conditions in order to demonstrate its economic value. That this new science will contribute in a large way to increase the efficiency of the farm output no one who is familiar with the effects of diet on animals can doubt.

Improvements in agriculture began with the improvement through selection of the wild ancestors of our cultivated plants. This process is still going on. Agriculture was greatly advanced through the invention of effective farm implements. Chemistry has contributed a knowledge of the nature of the soil and the composition of the plant sufficiently complete to give us an understanding of the nature and kinds of fertilization which promote plant growth and prevent soil exhaustion. The efficiency of the farmer has been advanced through the development of special varieties of crops suitable for particular types of soil and climate. Improved transportation has extended the range of profitable agriculture. Up to the present time, however, the farmer has been essentially ignorant of the principles underlying the effective use of the products which he has produced, either in the feeding of his children or his animals.

The science of nutrition is not yet mature, and so it is not possible to predict with any degree of certainty how effective an aid it may become for the advancement of human health and happiness, or for promoting the economic welfare of the nation. It is

certain, however, that we are now in a position to avoid some of the more important mistakes which have been made in the past by no small proportion of even fairly successful farmers.

The writer well remembers several occasions in his boyhood on a farm in eastern Kansas, when a hundred or more pigs were converted into unprofitable runts by being kept in a dry lot and fed for a time solely upon corn. No better example of the denseness of ignorance of even the simplest principles of feeding can be given than to point out that fifteen years ago no one seems to have been aware that a hog could not grow if fed all it wanted of one of our common cereal grains.

THE NECESSARY PROTEIN SUPPLY

A brief summary of the newer viewpoints in nutrition will make clear the manner in which this branch of science can apply to agriculture. It has been fully demonstrated that there are pronounced differences in the constitution of the proteins, or flesh-forming principles of foods, depending upon their source. Each species of plant has proteins of an architecture different from those of any other species, and even the different parts of the same plant, *e.g.* the leaves and seeds, contain proteins of kinds which have very different composition. A protein is made up of about twenty kinds of simple units which are liberated on digestion, but in the protein molecule these are united in chain-like arrangement, and the nature of the protein is determined by the proportions among the different digestion products, and by the order in which they are united. Many millions

of different combinations of this number of the so-called building stones, or amino acids, are possible, and so as many kinds of proteins may possibly exist.

The nutritive value of any protein is limited to the extent to which the products of its digestion can be rearranged to form the body proteins of the animal which takes it as food. It is known that many of the food products contain proteins which are not very efficient for promoting growth. It is well established, however, that the proteins from two different sources may be each of poor quality when it serves as the sole source of protein in the diet, yet, when taken together, they may make good each other's deficiencies and constitute a very efficient protein supply. Since protein is the most expensive component of a ration for farm animals, it follows that an understanding of the combinations of foods which yield proteins which are utilizable to an extent of 50 to 65 per cent, as are some, makes possible a far greater efficiency of utilization of the feeding-stuffs available than would be realized if proteins of half these values were fed, as is not infrequently done.

Remarkable results have been achieved through breeding animals for milk production, and in this work it has been found that cows with very great capacity as producers are likely to show signs of deterioration in other respects, especially in fertility. There is much reason to believe that the limiting factor in milk production in animals of the higher classes is the nutritional one. This may be illustrated by a consideration of the protein factor, although this is by no means the only one which enters into the successful feeding of farm animals. The cow cannot make milk without materials with which to do it. She has little or no capacity to produce synthetically the

twenty digestion products of proteins, and a deficiency of any one of these in the food will absolutely limit the extent to which those present in the food can be utilized. Animal husbandmen are now interested in determining whether or not the limit hitherto set to production in the dairy cow is not found in the extent to which a rearrangement is possible of the "building-stones" furnished by the ration, so as to form the new structures into which the food is transformed in milk production. It is not possible to say, at the present time, how much may be achieved in the future in this direction by the application of exact studies of the principles of nutrition.

CHIEF VITAMINS AND NUTRITIVE VALUE

The new discoveries of vitamins and their properties have excited greater interest than any other in recent years. This is natural because their existence was unsuspected, and because so very little of each of them is necessary for the promotion of growth and the maintenance of health in man or animals. Their importance fully justifies the enthusiasm which they have been accorded by the public. It is necessary that the content of the diet in each of the essential vitamins for any given species be carefully considered if optimal well-being is to be secured.

There are at least four vitamins which play a rôle in human nutrition. These are designated as vitamins *A*, *B*, *C* and *D*. The evidence which investigators accept as conclusive for the existence of each of these substances as a chemical substance, without which health and even life cannot be long maintained, consists of a demonstration of the peculiar pathological state which develops when one or another of them is left out of the diet, the latter being otherwise satisfactorily consti-

tuted. The criteria which are usually mentioned as service in enabling the investigator to decide that a certain diet does not contain a particular vitamin, represent only the most obvious symptoms of vitamin deprivation. Thus a lack of the vitamin *A* leads after a few weeks to the development of an extremely severe lesion of the eyes. A lack of vitamin *B* causes enfeeblement, and loss of muscular control. A lack of vitamin *C* causes damage, especially to the capillary blood vessels, causing hemorrhages. Deprivation of vitamin *D* leads to especial damage to the skeleton, resulting in rickets and related conditions when the diet is not appropriately constituted with respect to calcium and phosphorus.

Vitamins *A* and *D* are generally associated in their distribution in natural foods, but the content of different foods in each differs markedly. Vitamin *D* is found in but very small amounts in any ordinary foods, and is present in liberal amounts only in the oil of fish livers. It is of very great importance in the prevention and treatment of rickets in children, and under certain circumstances may be utilized in the feeding of farm animals. The remarkable effects of sunlight, in producing favorable effects on skeletal growth, make it probable that this physical agency is to be relied upon, rather than the more expensive oils containing the vitamin *D*, in preventing skeletal defects in farm animals.

PREVALENCE AND CAUSES OF OSTEOMALACIA

Osteomalacia, or softening of the bones, has long been common among farm animals in certain parts of the world. In the United States, Oregon, Washington, Louisiana and Mississippi are the greatest sufferers, all domestic animals being affected to a greater or

less degree under ordinary feeding practices. In Norway it is also common among cattle, as it is also in the Belgian Congo. The scientific study of the effects of diet on bone formation during the last few years has made it evident that osteomalacia is a condition in the adult animal which is analogous to rickets in the young. It is due entirely to faulty diet and is to be avoided by the provision of rations which contain the proper content of calcium and phosphorus. It occurs in those regions where the ground waters and the soil solution are deficient in calcium or phosphorus to a sufficient degree. Obviously the remedy for this condition is prevention through feeding the proper mineral element. Prevention, and not cure, is alone profitable in farm practice with animals.

Bone defects are extremely common in growing swine in many parts of the United States, and are generally the results of feeding too largely upon cereal grains, especially corn. Feeding stuffs are never profitably utilized when so fed as to induce bone disease, and consequent runtiness. The difficulty is easily evaded by providing growing pigs with diets which are complete in every respect. Competent advisers are available in many of our State Agricultural Experiment Stations, who are teaching farmers how to feed their animals more effectively.

The recent studies of Hart and Steenbock, of the University of Wisconsin, on the relative merits of hay cured under ordinary farm conditions in the windrow and of hay cured under caps, showed the latter to be far superior to the former as a source of calcium for farm animals. Milking goats were unable to assimilate the calcium of the old dried roughage, but could do so when given the product which had been properly handled. Animals which were seriously declining in weight and

health on a ration which according to the older standards would have been regarded as containing everything necessary for proper nutrition, but derived from old dried feeds, recovered at once when allowed to take the same kinds of feeds in part in a fresh, green condition. Failure of calcium assimilation was the outstanding feature of the condition described.

Theiler has described a condition of osteophagia, or bone eating, which is of great importance as a cattle disease in South Africa. Owing to the lack of sufficient phosphorus in the soil, and to the dryness of the soil, the plant growth does not supply sufficient of this element. Cattle develop the habit of searching for bones, and carry these about and chew upon them like dogs. In addition to the results of deprivation of phosphorus, the animals are frequently poisoned by sucking putrid material from infected bones. The condition is entirely cured or prevented by giving the animals sufficient amounts of some salt containing phosphate.

The investigations of Forbes and of Hart have shown clearly the difficulty, under ordinary farm conditions, of providing a sufficient amount of calcium for milking cows with high capacity for production, to prevent the animals from sacrificing a considerable amount of their skeletons in order to keep up the calcium content.

It is unnecessary to emphasize the extent of loss to farmers by feeding their animals during the productive period so as to deplete their vitality and undermine their health. I have been informed that there is so little lime in the soil and feeds in parts of Oregon that during milk production cows frequently deplete their skeletons so as to lead to spontaneous fractures. Milk is one of the richest of all foods in calcium and its production neces-

sitates a large intake of this element in order to prevent a draft upon the skeleton of the cow.

MALNUTRITION AND RELATIVE DISEASES

The value of fresh, green and succulent feeds, as against the same feeds in a dry condition, has long been appreciated by a few acute observers, but in general this, like many other things which make for success, has been overlooked. One of the more serious sources of loss in the dairy industry is due to sterility among bulls. It is impossible at the present time to explain whether or not this is entirely due to improper feeding or in part to lack of exercise from the effects of confinement. Certain it is that in the Middle West bulls, where allowed to run with the herd and get only pasture during the summer and essentially only corn and corn stover when not on pasture, remain vigorous and fertile to the age of twelve or more years. Such was the practice in Kansas during the author's boyhood, and no such thing as a sterile bull was ever heard of.

Now sterility among bulls is of fairly common occurrence. Recently the author visited one of the counties on the Pacific Coast where dairying is almost the only industry. Great trouble was being experienced with sterility in bulls. The farmers had been urged by the men of the Extension Service of the State Agricultural College to breed up their herds for milk production, and had been doing so for several years. They met with the unexpected difficulty that many high-priced bulls of good ancestry were sterile by the age of three or four years. On visiting some farms in that region it was found that many of the bulls were kept in the stable and confined to dry feed almost throughout the year. These animals were given very little, if any, of the anti-

scorbutic substance, vitamin C, for long periods of time. No experimental data have as yet been secured concerning the susceptibility of cattle to scurvy, so the significance of such a deprivation cannot be estimated; but there can be little doubt that the constant restriction of bulls to alfalfa hay, as was being done, caused a lowering of their productive powers. In laboratory animals restriction to diets which are derived in the main from a single natural food, even when the most obvious defects are made good by suitable additions, rarely results in much fertility.

The sterility so frequently seen in high-producing dairy cows may likewise have in part at least a nutritional basis. We need complete information concerning the intake and output of every element under such a regimen, and also of the extent to which the elements in any ration are utilized. It has been pointed out how calcium assimilation fails when the only source of this element is old dry hay, even though the amount furnished by the food may be adequate if it were assimilable. The high-producing cow, because she is giving out such large amounts of various nutrient principles in lactation, may debilitate herself because of excessive loss of one or more elements or complexes. It has been well established that lactating animals continue to give considerable amounts of milk long after the food supply is capable of forming a milk which is complete for the nutrition of the young, and upon which the young fail to thrive. We have seen many instances where the calcium and phosphorus demand upon the mother during lactation resulted in collapse and death without apparent cause. The skeleton in such instances was found to be of the most fragile character.

Over wide areas throughout the northern United States there has for

many years existed a condition which came to be known as the "hairless pig malady." The writer was informed that in the spring of 1916 approximately a million new-born lambs and as many new-born pigs were lost in that part of Montana drained by the Yellowstone River. Similar but somewhat less severe conditions have existed in many other states. It has been thoroughly demonstrated that this condition is caused by lack of iodine in the feed of the pregnant animals. The feeding-stuffs grown in these goiterous regions give no appreciable amount of iodine on analysis, yet they must contain very small traces of this element. Iodine is essential for the proper functioning of the thyroid gland, and deprivation of this element results in simple goiter in domestic animals as it does in man. The study of this problem has brought to light that there was only sufficient of iodine in the feeds to permit a sow to grow to maturity and appear to be in fairly good health, but not enough iodine to permit her to supply this element to a litter of pigs. The consequence was that the young were born with goiters, and born prematurely and in many cases without hair and dead. The provision of a few cents worth of a salt containing iodine will safeguard all the litter of pigs or all the lambs produced in a year on a stock farm.

It will be observed from what has just been said that there has been, and indeed there still is, a great loss of new-born and young animals in certain sections of the country because of a lack of sufficient iodine element. This occurs in the body in such exceedingly small amounts that its significance became appreciated within recent years only because the element, which occurs only to the extent of one part in three million in the normal body, is largely concentrated in the thyroid gland. The

loss of young constitutes a heavy drain upon the resources of the stock farmer under such conditions and makes his efforts yield little return either to himself or to the nation.

Those who come into close contact with the animal industry of the world know that there is much loss of young animals through weakness at the time of birth, and for unknown or obscure causes. This is especially liable to occur in those regions where a single type of crop is of outstanding importance. That these are cases of mismanagement of business through improper feeding, and consequent economic loss and loss of output from the farm, there is no reason to doubt.

It has been repeatedly emphasized in letters which have come to the writer that, although colts may grow up on alfalfa as their sole source of nutriment in certain parts of the West, they have little endurance, and frequently tend to drag their feet when in locomotion so that they become square toed.

Perhaps the best known source of loss in the animal industry through improper feeding is brought about through the production of soft pork. A normally nourished hog, when killed and cooled, acquires the well-known consistency of market pork. Certain animals, especially from parts of the South, remain soft after cooling, and so are referred to as soft pork. The difference between the normal and soft pork is so great that the latter is unsalable. It is impossible to tell by the examination of a hog whether it will yield soft pork or not, and so the production of such animals over a wide area is a source of great economic loss both to the packers, and also to the farmers, since the market tends to be unfavorable for hogs from regions which frequently produce these worthless animals.

Soft pork is likely to occur where

hogs are fed too largely upon peanuts and sweet potatoes, but it is not only these feeds which produce it. The cause is still obscure. The amount of soft pork has been greatly reduced by feeding the animals for a few weeks prior to marketing on some feeds which tend to make the fat hard. It is hardly to be expected, however, that animals which are grown on such restricted rations are in a good state of vigor. They are, more probably, in a state of vitality just above the plane necessary to the continuance of the species in these regions. It is well known that many animals which come from the districts which furnish the soft pork have poor bones, and many fractures occur during shipment. These are convincing evidences that pork production in the areas where soft pork continues to appear, notwithstanding the efforts to avoid it by finishing hogs for the market on special rations, indicates the animals are in an abnormal condition.

The land is never profitably utilized in the production of animals which are suffering from malnutrition of any kind, thus causing weakness in many of the young at birth; or from any weakness which stunts a number of the animals, during the period of growth, and, in order to make them marketable, necessitates their maintenance at a slower rate of growth over a longer period than would have been the case had growth taken place at the fastest rate possible. Foods are not utilized to their full value under such circumstances. It may be possible, where the land is of little value, to secure some profit by producing animals in such an unbusinesslike way. But the presumption always is justifiable, however, that a careful study of the situation by a competent investigator will reveal methods of modifying farm rations in these regions so as to improve the vi-

talities of the animals, increase fertility, avoid runtiness, increase the proportion of food ingested which is converted into utilizable product, and so make the farm more profitable to the nation and to its owner.

The feeding of brood animals is very expensive if their young fail to thrive. The feeding of young animals to maturity, or to a marketable age, is made unprofitable by providing a ration which cannot be efficiently transformed into flesh. At least this is true except in a few out-of-the-way places which can be utilized only for stock raising, and where the land investment is small. The early aging and loss of vigor of a dairy cow of proven worth, because of lack of knowledge of how to feed her with the result that some detail is neglected, when the ration is otherwise

good, results in loss of profit to those who invest their time and labor in her care, and in a lessening of agricultural efficiency.

There is every reason to expect that greater attention to the application of the scientific principles of nutrition, so far as these have been discovered, will increase the efficiency of the land in respect to animal production to a very considerable extent; but it would be idle to attempt to estimate how far this is possible. The examples of faulty practice in several lines which have been given will suffice to show the underlying principles involved, and will give an appreciation of the magnitude of the interests involved. Lack of space does not permit of a discussion of some of the errors common in the poultry industry.

Fertilizer Use in the United States

By SIDNEY B. HASKELL

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FERTILIZER practice in the United States is highly variable. The most intensive use is found on the narrow belt of sandy land which follows the Atlantic coast line from Massachusetts south to the Florida Peninsula. Truck crops, small fruits, early potatoes, sweet potatoes, and many other crops are here grown in an intensive way, quite generally with the aid of chemical rather than of animal fertilizers. Inland, we find very heavy use

of fertilizers in the Atlantic cotton states, but a much smaller use in the cotton states lying farther west. Fertilizer use in the Corn Belt is increasing, in general its extension being coincident with the development of winter wheat production. West of the Mississippi, however, there is as yet too small a fertilizer use to be significant.

Data are presented in the following table. For convenience, the total amount of fertilizer used is estimated

TABLE I—ESTIMATED ACRE APPLICATION OF FERTILIZER, AND CONCENTRATION IN PLANT FOOD

Section	Fertilizer Tonnage	Fertilizer Applied Per Acre, Pounds, on the Basis of			Approximate Concentration in Plant Food, Per Cent		
		Improved Land in Farms	Total Area in Crops with Acreage Reports	Acreage of Crops Normally Sold from the Land	Nitrogen	Phosphoric Acid	Potash
New England.....	351,709	115	165	1,341	3.92	6.85	4.59
Middle Atlantic.....	839,001	63.0	99	442	1.22	10.49	3.29
East North Central.....	615,414	14	20	105	0.76	13.93	2.77
West North Central.....	60,500	0.7	1	4	0.68	15.79	0.50
South Atlantic.....	3,670,476	151	230	533	3.06	10.15	3.16
East South Central.....	856,260	39	64	157	2.47	8.00	3.00
West South Central.....	259,785	8	10	18	2.46	8.00	3.00
Mountain.....	3,900	0.3	0.5	1	....	....	....
Pacific.....	82,819	7	13	43	8.19	5.77	3.39

Authority for tonnage: Fertilizer Control Bulletins from Alabama, Arkansas, California, Florida, Indiana, Maryland, Massachusetts, Michigan, Missouri, New Jersey, Ohio, Texas and Vermont.

Unpublished correspondence from Delaware, Kansas, Oklahoma, Pennsylvania, South Carolina and Virginia.

The *American Fertilizer Handbook*, for the remaining states.

Authority for concentration of plant food: Fertilizer Control Bulletins for Indiana, Maryland, Massachusetts and Ohio. Estimates from data in Control Bulletins for Florida and California.

Unpublished correspondence from Pennsylvania and Virginia. The figures for Missouri were obtained partly from the Bulletin, partly from correspondence.

The figures for the other states are estimates.

TABLE II—FERTILIZER TONNAGE BY STATES, 1913, 1923, WITH PERCENTAGE CHANGE

State	Fertilizer Tonnage		Increase (+) or Decrease (-) in 1923 Compared with 1913, Per Cent
	1913	1923	
Georgia.....	1,120,693	675,869	- 40
South Carolina.....	918,336	678,695	- 26
North Carolina.....	840,447	1,081,811	+ 29
Alabama.....	474,730	436,786	- 8
Virginia.....	412,434	420,897	+ 2
New York.....	380,000	375,000	- 1
Pennsylvania.....	340,000	370,550	+ 9
Florida.....	213,728	398,564	+ 86
Indiana.....	193,899	195,195	+ 1
Ohio.....	183,476	303,120	+ 65
Maryland.....	169,000	154,845	- 8
Maine.....	160,000	168,000	+ 5
New Jersey.....	156,661	157,496	+ 1
Mississippi.....	128,050	215,854	+ 68
Louisiana.....	98,779	108,711	+ 10
Tennessee.....	84,060	113,620	+ 35
Texas.....	75,500	73,300	- 3
Kentucky.....	75,000	90,000	+ 20
Connecticut.....	62,000	75,000	+ 21
Missouri.....	60,000	36,807	- 39
Michigan.....	57,985	87,841	+ 51
Arkansas.....	52,000	74,774	+ 44
Massachusetts.....	51,000	63,709	+ 25
Delaware.....	50,000	40,000	- 20
California.....	36,000	71,364	+ 98
West Virginia.....	31,852	38,000	+ 19
Illinois.....	30,000	14,000	- 53
New Hampshire.....	18,000	16,000	- 11
Vermont.....	14,500	18,000	+ 24
Rhode Island.....	9,000	9,000	...
Kansas.....	7,380	4,000	- 46
Oregon.....	4,500	8,000	+ 78
Wisconsin.....	4,000	15,000	+ 275
Iowa.....	3,500	11,600	+ 231
Minnesota.....	3,500	5,000	+ 43
Oklahoma.....	2,000	3,000	+ 50
Washington.....	1,500	3,000	+ 100
North Dakota.....	1,700	3,000	+ 76
South Dakota.....			
Nebraska.....			
Mountain States.....	4,300	3,900	- 9
Total exclusive of Porto Rico	6,529,509	6,619,308	+ 1

Authority: The American Fertilizer Handbook.

first on the basis of total acreage of improved farm land, which shows the relation between the application of plant food in chemical fertilizers and the upkeep of the soil; secondly, average acre application based on the total area of crops having acreage reports; and finally, and probably most significant, the probable use based upon the acreage of those crops which normally in whole or in part are sold from the land. It is these crops which receive the bulk of the fertilizer used. The last column also shows the average concentration in "plant food," that is, in nitrogen, phosphoric acid and potash, of the fertilizer used in the different sections.

SIGNIFICANT CHANGES

It is impossible to present a similar table for 1913, owing to the fact that basic data on concentration of plant food in fertilizers are lacking. Table II, compiled from estimates presented in the *American Fertilizer Handbook*, shows the more significant changes occurring in the two years under discussion.

Two conditions are responsible for failure of the industry to increase its tonnage output in a ten-year period. First and probably most important is disruption brought about by the World War, and particularly by post-war deflation. Second is the increase in concentration of plant food in mixed fertilizers, which has taken place in recent years. We have no means of measuring the extent of this increase. The possible change may be indicated by the Indiana experience. The sum total of the nitrogen, phosphoric acid and potash contained in the tonnage of that state in 1913 was 15.9 per cent. By 1923 this had increased to 20.3 per cent. Indications showing the fact of the increase are found in nearly all fertilizer-using states, but not in such form

as to lend themselves to statistical analysis.

A better picture of the increase of fertilizer use in the United States is shown by the following table, which reports tonnages year by year from 1913 through 1923:

TABLE III—TOTAL FERTILIZER TONNAGE FOR THE UNITED STATES (EXCLUSIVE OF PORTO RICO)

Year	Tons
1913.....	6,529,509
1914.....	7,322,364
1915.....	5,543,212
1916.....	5,320,824
1917.....	6,125,776
1918.....	6,682,932
1919.....	6,836,507
1920.....	7,589,239
1921.....	5,163,523
1922.....	5,860,722
1923.....	6,619,308

Authority: The *American Fertilizer Handbook*.

The effect of high crop prices in stimulating increased fertilizer use is markedly shown by the experience of the war years. During the war years, however, the fertilizer industry was unable to supply all of the fertilizer demanded, so that tonnage figures above presented do not show the real demand for fertilizer for the years in question.

The following table shows the average wholesale cost on the more important markets of the country of certain standard fertilizer materials of known quality, for the six months preceding March 1 of the years in question.

As between the years 1913 and 1923, the most significant change is in the price of tankage, a standard source of organic nitrogen. All other sources of organic nitrogen have likewise increased. One reason for the increase is the fact that within the ten-year period, the better grades of tankage, of dried blood, even of dry ground fish, have been diverted from the fertilizer mar-

TABLE IV—WHOLESALE COST OF FERTILIZER MATERIALS (PER TON)

Year	Ammonium Sulfate 20½% N.	Nitrate of Soda 15.6% N.	Tankage 10% Ammonia 15% B. P. L.	Muriate of Potash 50% K ₂ O	Acid Phosphate 16% P ₂ O ₅
1913.....	\$65.75	\$51.20	\$25.25	\$40.15	\$7.45
1914.....	59.70	45.45	29.15	40.35	7.13
1915.....	54.27	38.75	32.42	41.25	7.13
1916.....	73.40	60.67	30.72	389.00	10.82
1917.....	85.43	62.30	36.95	425.00	11.42
1918.....	142.47	94.80	64.00	343.00	16.63
1919.....	99.80	88.85	65.92	260.00	17.46
1920.....	108.63	61.78	72.62	197.86	18.80
1921.....	81.16	58.43	50.83	97.35	18.50
1922.....	46.25	45.98	34.74	38.65	10.81
1923.....	65.42	50.00	45.28	34.90	8.65

Authority: Oil, Paint and Drug Reporter, *American Fertilizer*, Drug and Chemical Markets.

ket to a relatively new outlet as animal feeds. This change in utilization of what are essentially by-products is apparently permanent.

We have no way of ascertaining the difference in the retail cost of mixed fertilizers between the years in question. Increasing concentration makes for economy. On the other hand, increase in transportation and labor charges may have more than counterbalanced the possible savings.

PROFIT FROM FERTILIZER USE

The wholesale price index of farm-products as estimated by the Bureau of Labor Statistics was 141 for the year 1923. Using the price data given above and a weighting based upon the estimates of the quantities of each class of fertilizer used in 1923, the index number of wholesale prices of fertilizer in the latter year would be 110. On this basis, fertilizer use in 1923 should have been more profitable to farmers than in 1913, and the natural expectancy would be for increased tonnage. The actual use of fertilizer in 1923 was disappointing to manufacturers. Tonnage lower than anticipated was due in part to uncertainty as to the future

tendency of crop prices, and in part to greater content of plant food.

Farmers buy fertilizer in the expectancy of increasing profits from farming. The fertilizer purchased must produce an increase in crop of a value sufficient to enable the farmer to pay for the fertilizer and in addition leave a margin sufficient to make the investment profitable. There are three factors in the problem:

- (1) The cost of fertilizer, as actually applied to the land with interest charged to the date of selling the crop.
- (2) The increase in crop produced by the use of fertilizer.
- (3) The selling price of the crop.

At the time fertilizer is purchased, the last two factors can only be estimated. With many crops the farmer must also estimate the time when the crop will be moved. Naturally, in view of uncertainties as to wind and weather, and of the inability of farmers to forecast probable prices, fertilizer-using farmers expect a rather high margin to compensate them for the risk involved.

In actual practice profits from fer-

tilizer use are usually due to an absolutely lowered cost of production per unit of crop. They may be due, however, to increase in number of units produced per acre, or per unit of equipment, even though the cost per unit of crop may be somewhat increased. In the former case, within rather wide limits, the amount of fertilizer used is independent of the selling price of the crop, although not of the psychological influence of depressed crop prices. As long as it is profitable to produce the crop, fertilizer will be used. In the latter case, however, use of fertilizer is markedly affected by change in crop prices. The following table, constructed from experimental data reported by the Ohio Agricultural Experiment Station, illustrates the principles involved.

size of crop as influenced by soil management methods followed.

The treatment given Plot 2 is very low in cost. It is also very productive in terms of increase in acre yield. The total cost per bushel up to the point of hauling the crop to the threshing outfit is very significantly lowered by the use of this fertilizer. On the other hand, still further increase in crop is produced by the treatment given Plot 11. The cost of additional fertilizer is so high, however, that the labor and fertilizer cost per unit of crop is increased. Despite this, with wheat at a relatively high price, the acre returns on Plot 11 are higher than on Plot 2. With wheat at a low price, this is not the case. Incidentally, it is interesting to note that the treatment given to

TABLE V—COMPARATIVE EFFECT OF FERTILIZER USE ON COST PER UNIT OF PRODUCT VERSUS NET RETURNS PER ACRE *

Treatment Per Acre	Unfertilized Checks	Plot 2 160 Acid Phosphate	Plot 11 160 Acid Phosphate 100 Muriate of Potash 50 Dried Blood 120 Nitrate of Soda
Wheat yield, 25-year average.....	11.4 bu.	19.6 bu.	28.1 bu.
Labor cost per acre, up to threshing and marketing †.....	\$12.00	\$12.00	\$12.00
17 hrs. man at 40 cents.			
26 hrs. horse at 20 cents.			
Fertilizer cost per acre.....	....	1.20	8.30
Labor and fertilizer cost per acre...	12.00	13.20	20.30
Labor and fertilizer cost per bushel.	1.05	0.673	0.722
Labor cost per bushel.....	1.05	0.612	0.427
Fertilizer cost per bushel.....	....	0.061	0.295
Value of crop less cost of fertilizer:			
Wheat at 90 cents.....	10.26	16.44	16.99
Wheat at \$1.20.....	13.68	22.32	25.42

* Experimental data from Ohio Bulletin 336, Wooster five-year rotation, applications on wheat.

† Ohio Monthly Bulletin, Vol. III, No. 11.

It should be noted that the assumed values for wheat are for wheat in the bundle prior to threshing. From this point on, the cost of handling varies with the number of bushels to be handled, and is without reference to the

Plot 2 over a series of years has failed to maintain the producing power of the soil. The contrary is true of the treatment given to Plot 11. The significance of these facts is that a low crop price may make necessary a soil man-

agement practice which leads to soil depletion.

From the above table it appears that a remedy for low crop prices and resulting agricultural depression may be secured through decreased cost of production brought about as a result of fertilizer use. There is danger in such an assumption, however, in that such fertilizer use increases the size of the crop; and increased production tends still further to decrease prices. It follows, therefore, that lowering production costs through the use of fertilizer, something which is entirely possible, is a remedy for the individual but not always for the industry.

It has been assumed generally that lower fertilizer cost will react to the benefit of fertilizer-using farmers. This is certainly true in case such lowered costs are not accompanied by an increase in the supply of fertilizer and significant increase in the amount of crop produced. If, however, there be a sudden sharp increase in supply and lowering in cost—as a possible result, let us say, of the development of the Muscle Shoals project—it appears that the gain of some farmers will probably be matched by the loss of others, and that the final benefit from the project will be to consumers of the products of the farm.

Extending Farm Diversification Westward and Northwestward Into the Great Plains Region and the Spring Wheat Area

By JOHN LEE COULTER, Ph.D., LL.D.

President, North Dakota College of Agriculture

THE map on the next page shows how the United States has in about one hundred and fifty years, 1774-1924, divided itself up into several more or less definite agricultural regions based upon a combination of forces such as soil, topography, rainfall, temperature, sunshine, accessibility to market, character and genius of the people, effectiveness of scientific research and education, transportation facilities, etc. These regions generally shade off one into the other. They are not necessarily permanent since changing conditions force changes in agricultural policies. But many of these regions have in large measure found themselves in whole or in part or are steadily working toward fairly definite goals. They know in large measure their outstanding problems and are on the way toward sound practical solutions.

DIVERSITIES OF FARMING

Between the Cotton Belt and the Canadian line and in general east of the 100th meridian we like to refer to the winter wheat, corn and hay and pasture areas. In all that general region diversified farming in varying forms predominates. In some sections winter wheat is the major project, in others corn, and in others hay and pasture. In a smaller way tobacco or potatoes or fruits or vegetables hold major importance. But in general we find a diversified system of farming more or less developed, although with many varying characteristics. Here, on almost every farm is to be found horse power far more important than tractor power;

and farm size units of dairy and beef cattle, sheep, swine and poultry predominate rather than the large ranges of beef cattle or sheep or the highly specialized commercial units of dairy cattle, swine or poultry. Family-sized diversified farms far outnumber the larger sized specialized units. On the general farm the labor is largely performed by the farmer and his family with little hired help and while there are one, two or three major projects such as corn, hogs, and beef or dairy cattle, there are usually several minor projects such as poultry, fruits, vegetables, potatoes, etc.; on the specialized farm usually more labor is employed, the farm in some cases is largely seasonal rather than continuous throughout the year, and there are fewer minor projects.

Not only does each state differ very materially from each other state but sections of the same state differ and individual farms vary widely in details of operation. Indiana is near the center of the northeast quarter of the United States. Since 1875 a period of 50 years—that state has had from 194,000 to 222,000 farms; the average acreage per farm has ranged between 97.4 acres and 105.3 acres; and the improved land has ranged from 71.8 acres to 81.3 acres per farm. More than 75 per cent of her farms are between 20 acres and 175 acres; the same was true 10, 20, 30 and 40 years ago. In 1920 there were 26.7 per cent of her farms under 50 acres; 31.7 per cent from 50 to 100 acres; 28.2 per cent from 100 to 175 acres; leaving only 13.3 per cent over 175 acres in

size. The same situation maintains in Ohio, except that the farms are a little smaller; in Michigan and Wisconsin the same is true; the same of Illinois except that the farms are a little larger; in Iowa they are even a little larger but still on the average under the quarter section in size.

Let one small table compiled from the Federal Census of 1920 present the basic data—the average improved acreage per farm.

AVERAGE ACREAGE OF IMPROVED LAND PER FARM 1920

The Northern Group of States		The Southern Group of States	
Maine.....	41.0 acres	Delaware.....	64.4 acres
New Hampshire.....	34.2 "	Maryland.....	65.5 "
Vermont.....	58.2 "	District of Columbia.....	20.9 "
Massachusetts.....	28.4 "	Virginia.....	50.8 "
Rhode Island.....	32.5 "	West Virginia.....	63.2 "
Connecticut.....	30.9 "	North Carolina.....	30.4 "
New York.....	68.1 "	South Carolina.....	32.1 "
New Jersey.....	52.4 "	Georgia.....	42.0 "
Pennsylvania.....	58.6 "	Florida.....	42.5 "
Ohio.....	72.2 "	Kentucky.....	51.6 "
Indiana.....	81.3 "	Tennessee.....	44.3 "
Illinois.....	115.1 "	Alabama.....	38.6 "
Michigan.....	65.8 "	Mississippi.....	34.3 "
Wisconsin.....	65.8 "	Arkansas.....	39.6 "
Minnesota.....	120.4 "	Louisiana.....	41.5 "
Iowa.....	134.0 "	Oklahoma.....	94.4 "
Missouri.....	94.4 "	Texas.....	71.6 "
New England States..... 39.1 acres		South Atlantic States..... 41.9 acres	
Middle Atlantic States..... 62.5 "		East South Central States..... 42.2 "	
East North Central States..... 81.0 "		West South Central States..... 64.4 "	

Omitting from consideration in this study the Pacific Coast states, the Desert and Irrigation Areas, the Arid Inter-mountain Plateaus and the Rocky Mountain Regions, what may be said will be confined to the lines of development during the next ten or twenty years in the Spring Wheat Area and the Great Plains Region.

FARM PROBLEMS

Farmers with major projects such as sugar or wool may be tossed about from years of great prosperity to years

of great depression by the sudden change in government policy, such as a revision of the tariff, since we are large importers of these staple products. Producers of other special crops, especially bulky perishables such as potatoes or fruits or vegetables with relatively small chance to invade foreign markets, may experience individual good years or bad years according to the bountifulness of nature or the short crops. Here relatively small reduction

or expansion in acreage may create havoc. Here then the problems are not so much Federal legislation, such as tariff changes, but co-operative organizations of producers:

- (1) To influence acreage;
- (2) To retain the lower quality products at home in years of surplus and to get them to the proper markets in years of scarcity;
- (3) To grade and standardize, pack, store and market their products in an orderly fashion;
- (4) To develop ways and means of

drying, curing, canning, and otherwise preserving the surplus in years or months of plenty to supplement the market in years of necessity or in out-of-season months; and

(5) To perform many other useful services for both the producer-sellers and for the consumer-buyers.

In other great areas the problems are more those of excessive or deficient credit, of land value inflation, of transportation or taxation, of disorderly marketing or poorly planned production. In all districts there are multitudes of problems of right farm practice and correct use of science.

But in the Great Plains Region and the Spring Wheat Belt reorganized production and marketing stand out as the greatest problems of the next decade. This is the land of surplus wheat and beef cattle production. This is the newer area with all the awkwardness of youth. It has not yet found itself.

(1) It is young. Fifty years ago it was largely occupied by Indians, by buffalo, deer and antelope, and by wild chickens, ducks and geese.

(2) It is growing and changing as it grows. It extends out to the borders of present marginal lands which must for centuries be devoted to range, dry farming or irrigation.

(3) It is far from markets and therefore has many problems of transportation, especially of high freight rates, because of its magnificent distances, sparse population and small volume of tonnage.

(4) It is a land of high interest rates—a terrible handicap, especially when passing through the inevitable transition from exploiting original wild lands to a settled or stable agricultural system. High interest rates are natural to newness, sparse population, low land values and temporary farming systems. Much of this area in addition has the load of an excessive number of small banks to carry. Each has so small a

volume of business and so large an operating cost in proportion that high interest rates are inevitable until increased population and business increase their volume or consolidations decrease their number.

In spite of the newness of this region, of its sparse population, its high freight rates and high interest rates, and its other growing problems, this area is on the very border of a district extending from Wisconsin and Minnesota south through Iowa and Missouri (in fact extending out into the corner of North Dakota, farther into South Dakota, still farther into Nebraska and Kansas and even well out into Oklahoma and Texas) where farms have been reduced in size, land values have increased, the population is much more dense, interest rates are lower and agriculture has passed from the soil-robbing exploitive type to a well planned, organized system. Indeed, if one goes well out into the Spring Wheat Area and into the Great Plains Region, one will find hundreds of individual farms already reorganized and established on a safe, sound, profitable and even permanent diversified basis. Here and there a large community will be found in the same condition of progress. The big next step in development is carrying forward this program. Indeed, tremendous progress has already been made. This can best be illustrated by a study of the changes taking place in North Dakota. The map (p. 272) shows this state largely in the Spring Wheat Area.

From the Federal reports we get the following story of the development of wheat and rye in North Dakota.

ACREAGE OF WHEAT AND RYE IN NORTH DAKOTA

1879	84,854
1889	2,710,989
1899	4,479,246
1900	8,236,970
1919	11,520,005

REORGANIZATION WORK

Reorganization work began soon after 1910 and was progressing nicely when the war program of more bread grains, wheat and rye stopped the program and in fact set it back for several years. Year after year the weeds have been increasing until dockage problems

the vegetable and fruit gardens meant not only family requirements but new sources of income. The preceding five years have witnessed tremendous progress. Let the official records speak for themselves.

Here we see that in five years the farmers have decreased their wheat and rye by 3,119,000 acres or 27.1 per cent.

NORTH DAKOTA

	1919	1924	Increase or Decrease	
			Acreage	Per Cent
Wheat acreage.....	9,098,000	7,436,000	-1,662,000	-18.3
Rye acreage.....	2,423,000	966,000	-1,457,000	-60.1
Total bread grains.....	11,521,000	8,402,000	-3,119,000	-27.1
Flax acreage.....	650,000	1,925,000	1,275,000	196.1
Bread grains and flax acreage.....	12,171,000	10,327,000	-1,844,000	-15.2
Corn acreage.....	191,000	1,221,000	1,030,000	539.2
Oats acreage.....	2,423,000	2,746,000	323,000	13.3
Barley acreage.....	1,085,000	1,524,000	439,000	40.4
Total feed crops.....	3,699,000	5,491,000	1,792,000	48.4
Tame hay acreage.....	544,000	1,111,000	567,000	104.2

have reached an important place; year after year plant diseases—rust, smut, scab, root rot, etc.,—have developed; lower yields per acre, frequent years of lower quality, the tremendous break in prices in 1920-21, and other influences which need not be listed here have added to the difficulties.

But the silver lining has been clearly visible to many—the development of oats and barley and corn as feed and forage and silage crops meant less bread crops, more rotation, cleaner soil, control of weeds and diseases, and finally more livestock (beef cattle, dairy cattle, sheep and swine); the introduction of alfalfa, clover, and other tame and cultivated pasture and hay crops had the same meaning; more attention to the livestock, the poultry,

In turn, they have increased their flax 1,275,000 acres. This is a cash crop which like sugar and wool is well protected by the Federal tariff since the United States is on an import basis in the matter of flaxseed and linseed oil. It is to be noted here, however, that further increases will soon place this country on an export basis and farmers are being urged not to further expand this crop to any material extent lest the world market be made the basis of the domestic market. The net decrease of wheat, rye and flax is 1,844,000 acres.

This does not mean abandoned land or abandoned farms. The increase in corn, oats and barley—three staple feed crops—is 1,792,000 acres or almost equal to the decrease noted above in bread grains and flax. Even 1924,

when the nation had feared a complete corn failure, North Dakota matured a large part of its corn crop either to be hogged down or fed as corn and fodder or put into the silos. Of equal importance is the increase of alfalfa, clover and other types of tame hay. All of this means a safe, sound and profitable livestock industry. Facing a series of years of poor grain crops and poorer prices, while justly urging state and nation to render emergency aid because the crisis was clearly brought about through war policies, the farmers of North Dakota have been busy putting their own house in order. It is a clear illustration of the reorganization or readjustment of agricultural programs in the Spring Wheat Area and the Great Plains Region.

FACTORS IN AGRICULTURAL RECOVERY

Much is being said of the recovery of agriculture in 1924. It is due to a combination of forces. Of first importance is the fact that in the United States the farmers have reduced their wheat acreage from almost 76,000,000 acres in 1919 to less than 54,000,000 in 1924, a decrease of about 22,000,000 acres. Assuming a series of years average yield per acre of 15 bushels for the United States, this meant a decrease in the world supply for 1924 compared to 1919 of about 330,000,000 bushels. This is the basic fact of greatest importance—the reduction in world supply. Next in importance was the rapid re-development of effective world demand through re-establishment of international credits and settlement of reparations. This readjustment of demand and supply brought about better prices—an advance in North Dakota of from 40 cents to 50 cents a bushel compared to the years just preceding. Thinking in terms of a 100,000,000 bushel crop of wheat for North Dakota, this meant a gain of 40 to 50 million

dollars. Relatively the same results were secured in the case of flax and rye, the other two leading grain or seed crops of North Dakota.

The third factor which brought about return to better times in North Dakota was the fact that a good yield was secured in 1924, in the case of wheat over 50,000,000 bushels more than in 1923. This was nature's contribution, which is not dependable from year to year. Over a period of years it seems that we cannot now depend on an average of more than 12.5 bushels per acre. The Spring Wheat Belt shows an average of 12.4 bushels per acre from 1910 to 1914 and 12.8 bushels per acre from 1915 to 1919. This is an average of 12.5 bushels for the ten-year period. But it may fall to 7.5 bushels one year and go up to 17.5 bushels the next. To secure a good yield and good price the same year as we have this year, 1924, cannot be depended upon.

But North Dakota's recovery is not due altogether to the higher prices and to the higher yields of wheat and other grain and seed crops. Each of these factors evidently added something like \$50,000,000 over the returns for 1923. In addition we have to consider the savings due to the fact that the farmers are more and more producing their own family supplies and the increased receipts from sale of poultry products, dairy products, bee products, meats, wool, potatoes, vegetables and fruits. This, of course, is an indirect way of marketing corn, oats and barley, alfalfa, clover, and other feed and forage crops.

Finally, the query is made, will farmers in North Dakota and other parts of the Spring Wheat Area and Great Plains Region continue this program of accelerated diversification, or will they be influenced by good crops of good quality and good prices to return to "the good old days" of small grains as

the major project? My judgment is that they will not generally go backward. Some will, but more will go forward with a net gain for a safer, sounder and more profitable type of farming in this great area. This is sure to mean a breaking down of many farms which are too large for operation by the average farmer with his family. Thus, the average farm in Ohio, Indiana, Illinois, Michigan and Wisconsin is 108.5 acres, while in North and South Dakota in comparison it is 465 acres or four and one-half times as large. The same is true of improved land per farm.

Farming is not a business where men expect to get rich. The ideal is a prosperous, happy, contented, intelligent family in every farm home. To reach this ideal farming must be organized on a sound basis, both practical and scientific. Whereas in 1919 the three small

grain cash crops, wheat, rye and flax, represented 62.6 per cent of all crop acreage, in 1924 they represented only 53.2 per cent. It is believed that in another five years these cash crops will not occupy more than one-third of the crop land in the state. Smaller and better organized farms, more farms, more children in our schools and more people to support them, lower taxes per capita, more and higher valued product to be shipped with relatively lower freight rates, a greater volume of banking with lower interests rates, smaller acreage of small grains but higher yields per acre at lower cost per bushel, more hay and pasture, feed and forage crops and livestock and livestock products and greater income from this source, more home owning, prosperous, happy, educated and contented people—these are some of the results expected from this program of reorganization.

The Relation of Local Farm Output to the Local Product

By JOHN M. McKEE

Deputy Secretary of Agriculture, Commonwealth of Pennsylvania

THE time is rapidly approaching when the United States will cease to be an exporting nation of agricultural products. Many of our eastern states are already in the stage where our food production does not meet consumption needs. This congestion of population in towns and cities as compared with the rural residence is serving to bring the question of local markets in relation to local output in the foreground. The high intermediate handling charges and transportation cost absorb such a large percentage of the consumer dollar as to further accentuate the importance of near-by markets.

The number and extent of local markets is readily apparent from the census figures of Pennsylvania's urban population.

NUMBER AND SIZE OF URBAN CENTERS IN PENNSYLVANIA

20 market centers with population of 25,000 to 1,000,000 or over.
57 market centers with population of 10,000 to 25,000.
93 market centers with population of 5,000 to 10,000.
144 market centers with population of 2,500 to 5,000.
659 market centers with population of less than 2,500.

While only approximately one million of Pennsylvania's nine million population are engaged in farming, yet the value of her agricultural products ranks seventh in the United States. There is, then, a very definite need and problem before market officials, producers and consumers, which is how to bring production and consumption to the most economic balance.

It is only within the last year or two that such a work has been definitely projected and carried out. During the summer of 1923, under a co-operative arrangement,¹ the production of food products in the Altoona district was studied, and some very important findings resulted. Probably some of the conclusions set forth illustrate this best.

POTATOES

Survey Showed:

- (1) Blair County supplies 14 per cent of 140,000 bushels consumed from September to May inclusive.
- (2) Average acreage of potatoes per farm (1.37 acres) too small for efficient production.
- (3) Delivered cost of shipped-in potatoes (125,000 bushels annually) has been from 60 cents to \$1.50 per bushel during past three years.
- (4) Freight paid on shipped-in potatoes has averaged 25 cents per bushel. This is a direct advantage to local growers over competitors.
- (5) Consumers prefer well-graded home-grown potatoes.

Recommendations:

- (1) A minimum of three to five acres per farm necessary for economical use of labor-saving machinery and lower production cost.
- (2) Adoption of production methods of most successful growers:
 - a. Thorough soil culture and ample fertilization.

¹ A co-operative project with the U. S. Department of Agriculture, Pennsylvania State College, Pennsylvania Department of Agriculture, Blair County Farm Bureau and the Altoona Chamber of Commerce, published in Bulletin No. 184, "Adjusting Production to Meet Home Demands in Blair County, Pennsylvania." Pennsylvania State College, State College, Pa.

- b. Use of disease-free seed.
- c. Thorough spraying (6-10 times).
- d. Adequate and efficient machine equipment.
- (3) Marketing season can be lengthened to May, with adequate common storage facilities.
- (4) Co-operative effort in spraying, grading and marketing will reduce costs and increase profits.

POULTRY

Survey Shown:

- (1) Blair County supplies only 11 per cent of 2,132,340 dozen eggs and 23 per cent of 634,000 pounds of dressed poultry consumed.
- (2) Average farm flock consists of 90 hens producing 60 eggs each per year of which only two-thirds are marketed.
- (3) Premium paid for the limited supply of high-grade local eggs. Average of local eggs inferior to better grades of western eggs.
- (4) Acute need for cold storage facilities.

Recommendations:

- (1) Development of farm flocks from good laying strains of heavier breeds.
- (2) Farm flocks should be increased to minimum of 200 hens each for economical production.
- (3) Poultry feeding a profitable outlet for lower grades of wheat.
- (4) More attention to better handling and grading of eggs.
- (5) Good prospects for successful co-operative marketing.
- (6) Cold storage facilities must be secured to efficiently market eggs.

WHOLE MILK

Survey Shown:

- (1) Blair County supplies 100 per cent of 20,861,000 pounds consumed in Altoona.
- (2) Blair County supplies 15,000,000 pounds to other markets.
- (3) Co-operative distribution has been successful for over two years.

Recommendations:

- (1) More efficient production per cow rather than more cows.

- (2) No increase in production unless demanded by market conditions.
- (3) Expansion of present co-operative distribution.
- (4) Campaign for increased milk consumption in Altoona.

TIME AND DISTANCE FAVORS

NEAR-BY PRODUCERS

It is doubtful if producers within reach of markets have fully realized or appreciated the advantages of such favorable location. Consumers commonly have a preference for home-grown products even at a higher price, providing the quality has been maintained as it should be. Dairy men in remote sections usually have to market their milk in the form of butter or other manufactured dairy products, while near-by producers sell the major portion of their product as whole milk at a considerably higher price. It is true that with refrigeration methods commodities can be moved almost any distance, but this is costly. Eggs and vegetables also meet with special favor due to freshness based on nearness to market.

The freight advantages of near-by markets are shown by the two following tables on apples and potatoes, which give the freight from the larger producing centers competing with Pennsylvania producers. These rates contain some approximations, but indicate the relative ratio.

It is evident that the shippers of fruit from the far Northwest, shipping largely in bushel carriers, can only afford to send the very best products which must sell at a relatively high price to justify the freight rate of 74 cents per bushel. At a price of \$1.50 per bushel there, the freight would be approximately 50 per cent of the farmers' prices, to which would still have to be added the package cost, the local packing plants charge, and other items. A potato grower in Waupaca, Wis.,

APPROXIMATE FREIGHT RATES *

From Various Shipping Points to Pennsylvania Market

Rates do not include refrigeration or carrier's protective service on apples or heater service on potatoes.

APPLES

Shipping Point	Market											
	Philadelphia			Harrisburg			Scranton			Pittsburg		
	Cwt.	Bu.	Bbl.	Cwt.	Bu.	Bbl.	Cwt.	Bu.	Bbl.	Cwt.	Bu.	Bbl.
Biglerville, Pa.	25½¢	13¢	41¢	17½¢	9¢	28¢	28½¢	14½¢	45½¢	31¢	15½¢	49½¢
Chambersburg, Pa.	28½¢	14½¢	45½¢	17½¢	9¢	28¢	28½¢	14½¢	45½¢	31¢	15½¢	49½¢
Bedford, Pa.	31¢	15½¢	48½¢	30¢	15¢	48¢	31¢	15½¢	49½¢	27¢	13½¢	43¢
Falls, Pa.	28½¢	14½¢	45½¢	28½¢	14½¢	45½¢	11½¢	6¢	18½¢	27¢	13½¢	43¢
East Hebron, Me.	42½¢	21½¢	68¢	42½¢	21½¢	68¢	40½¢	20½¢	65¢	36½¢	18¢	58½¢
Rochester, N. Y.	28½¢	14½¢	45½¢	28½¢	14½¢	45½¢	28½¢	14½¢	45½¢	27¢	13½¢	43¢
Hancock, Md.	31¢	15½¢	49½¢	34¢	17¢	54½¢	31¢	15½¢	49½¢	31¢	15½¢	49½¢
Winchester, Va.	32¢	16¢	51¢	25¢	12½¢	40¢	32¢	16¢	51¢	31¢	15½¢	49½¢
Lewiston, Idaho †	1.50	74¢	..	1.50	74¢	..	1.50	74¢	..	1.50	74¢	..
Spokane, Wash. †	1.50	74¢	..	1.50	74¢	..	1.50	74¢	..	1.50	74¢	..

POTATOES

Shipping Point	Market											
	Philadelphia			Harrisburg			Scranton			Pittsburgh		
	Cwt.	Bu.	Sack	Cwt.	Bu.	Sack	Cwt.	Bu.	Sack	Cwt.	Bu.	Sack
Macungie, Pa.	19¢	11½¢	28½¢	21½¢	13¢	32½¢	25¢	15¢	37½¢	32¢	19¢	48¢
Stewartstown, Pa.	22¢	13¢	33¢	22¢	13¢	33¢	28¢	17¢	42¢	31¢	18½¢	46½¢
Somerset, Pa.	31¢	18½¢	46½¢	30¢	18¢	45¢	31¢	18½¢	46½¢	19¢	11½¢	28½¢
Coudersport, Pa.	32½¢	19½¢	49¢	32½¢	20¢	49¢	28½¢	17¢	43¢	26½¢	16¢	40¢
Caribou, Me.	60¢	36¢	90¢	65½¢	39½¢	98½¢	60¢	36¢	90¢	60½¢	38½¢	91¢
Freehold, N. J.	19½¢	11½¢	29½¢	28½¢	17¢	43¢	28½¢	17¢	43¢	34¢	20½¢	51¢
Wayland, N. Y.	28½¢	17¢	43¢	28½¢	17¢	43¢	28½¢	17¢	43¢	27¢	16¢	40½¢
Cadillac, Mich.	58¢	35¢	87¢	57¢	34¢	85½¢	58¢	35¢	87¢	38¢	23¢	57¢
Waupaca, Wis.	65¢	39¢	97½¢	64¢	38½¢	96¢	65½¢	39½¢	98½¢	44½¢	26½¢	67¢
Moorhead, Minn.	80½¢	48½¢	1.21	80½¢	48½¢	1.21	81¢	48½¢	1.21½	60¢	36¢	90¢

* Data furnished by Mr. William Lynn, Bureau of Markets, Pennsylvania Department of Agriculture.

† Standard Boxes.

shipping potatoes to Philadelphia would experience a 39 cents per bushel charge in competition with Coudersport, Pa., potatoes at 19½ cents per bushel; or, in other words, the Couders-

port grower would enjoy a freight advantage of 19½ cents per bushel. The growers in either case would be experiencing a relatively heavy freight charge on potatoes that would prob-

ably only bring a gross return of 40 to 50 cents per bushel to the grower.

To the local grower who does not have to depend on freight, but can use his own or a local truck, cutting out the freight haul and several intermediate handling charges, the opportunity for profit is much better. It is common for potatoes to sell in producing areas around Pittsburgh, such as Butler County, at \$1 a bushel on the farm, while potatoes will not be bringing more than 60 cents loaded aboard the cars in Potter County.

A study by the Bureau of Markets of the Pennsylvania Department of Agriculture showed that there were 1,158 cars of potatoes unloaded in Scranton in the year 1923. Of these, 100 cars were from Michigan, 24 from Wisconsin, 22 from Minnesota, 7 from North Dakota. The freight on potato shipments from the Lake states alone amounted to close to \$50,000. Conditions for producing potatoes within the trucking area of Scranton are favorable, so that a large portion of this freight bill could be rendered unnecessary by expanding home production.

Eggs furnish a good illustration of low transportation costs. The majority of Pennsylvania shipped eggs moving to the New York market cost approximately two cents a dozen express, with one cent a dozen for the case, or three cents between the remote farm and the large metropolitan commission farm.

ESSENTIAL MARKET SERVICES

In the minds of many consumers there appears to be a belief that, from the time the product leaves the producer until it reaches the consumer, it passes through a "no-man's land" where numerous greedy middlemen take their toll with the result that of the

consumer's dollar, the producer receives possibly 30, 40 or 50 cents. It is not the purpose of this paper to either attack or defend the middleman, but progress in reducing the cost of distribution will be made more rapidly if we recognize what takes place between producer and consumer. For the great majority of food products the following services are essential: assembling, grading, packaging, processing, storing, transporting, financing and distributing. To these might possibly be added risk-taking and advertising, in many cases.

Space cannot be taken here to expand these services, but it should be readily apparent that they are necessary and that they must be rendered by someone, and whoever does this expects to be paid. If the farm wife delivers a pound of butter to the house wife in town, she is then rendering all these services. If the urban dweller goes out to the farm or roadside market, he is rendering part of such services while the producer bears the others. In this case they are not thought of as distinct services, but when the product passes through many intermediate hands for long distances and there are considerable periods of time, these different services are more evident and costly. No system of marketing reform that fails to recognize these facts will make much progress.

METHODS OF MARKETING

All methods of disposing of farm products will be found in connection with any local market of much size. The direct method by which the producer sells through the roadside market, canvases from door to door, or through curb market or market house, can be used extensively.

While the roadside market is only coming into prominence there is little

doubt as to the great outlet this will provide for farm commodities. The demand for products at the roadside markets will come not only from nearby residents but from the millions of tourists traveling the highways daily. More attention to furnishing a first-class product and fixing a fair price based on the recognition that the purchaser is bearing a good share of marketing costs, together with maintaining the roadside markets in a clean and attractive condition, will go a long way toward increasing this market outlet.

Selling from door to door or at market houses are old established methods which still meet with favor and furnish a mutually satisfactory plan to both the seller and the buyer.

The rapid expansion of the chain stores will bring about some change in the producer to retailer trade, since the chain stores are more inclined to buy in carload lots from the large producing centers, where they can get a standard grade of product which will run more uniform than the seasonal output of local producers. This is a market outlet that is not closed to local

producers if they will offer a substantial quantity of graded, dependable products. In all of these methods the number of intermediate handlings are reduced very greatly and transportation charges are at a minimum with the result that both producer and consumer find the outcome satisfactory. The general price level of commodities is usually based upon the price at which such article can be shipped in carload lots, or in a district where a surplus is produced, the price will be based on what can be secured in some larger distant market less transportation cost. In either case there is considerable variation up or down based on quality and particular market conditions.

SOURCES OF APPLES AND POTATOES

The extent to which local markets are demanding more products than are supplied, is indicated by the two charts showing apple and potato receipts of Pennsylvania cities for 1923. The production of both potatoes and apples can be increased sufficiently to supply home markets within seasonal limits.

ORIGIN OF APPLE RECEIPTS AT PENNSYLVANIA CITIES, 1923 *

City	Pa.	N. Y.	Wash.	Va.	Del.	W. Va.	Md.	Mich.	Idaho	All Others	Total 1923	Total 1922	Total 1921
Allentown.....	14	34	10	..	7	..	3	..	..	6	67	34	57
Altoona.....	19	49	34	5	2	2	3	3	4	..	126	84	89
Bethlehem.....	32	13	10	..	1	13	1	..	..	6	77	5	13
Easton.....	2	8	1	1	1	4	1	..	..	1	19	8	9
Erie.....	4	42	12	..	3	1	3	2	13	14	94	50	30
Harrisburg.....	16	3	27	1	1	1	2	..	..	5	55	46	73
Johnstown.....	48	43	14	5	1	24	5	1	..	19	160	69	89
Lancaster.....	29	5	10	..	..	..	..	..	..	..	44	51	117
Philadelphia.....	474	637	1,199	376	251	85	153	..	10	71	3,256	2,539	3,416
Pittsburgh.....	141	1,511	686	72	124	178	45	82	52	114	3,005	3,020	2,808
Reading.....	10	25	15	1	..	..	..	..	..	13	64	34	82
Scranton.....	37	134	46	3	14	19	16	14	6	27	316	217	337
Wilkes-Barre.....	5	31	42	..	20	..	2	10	4	13	127	130	291
Williamsport.....	..	7	5	..	..	..	..	1	..	..	13	21	18
York.....	9	2	..	..	..	..	..	..	..	..	11	18	47
Total, 1923.....	840	2,544	2,111	464	423	327	234	113	89	289	7,434	..	..
Total, 1922.....	397	2,896	1,742	84	459	156	133	51	79	329	..	6,326	..
Total, 1921.....	493	3,134	2,146	179	60	146	52	59	164	1,043	..	..	7,476

* Compiled by William Lynn, Bureau Markets, Pennsylvania Department of Agriculture.

THE RELATION OF LOCAL FARM OUTPUT TO THE LOCAL PRODUCT 283

ORIGIN OF POTATO RECEIPTS AT PENNSYLVANIA CITIES, 1923*

City	Pa.	Maine	N. Y.	N. J.	Va.	Mich.	Wis.	Minn.	Md.	All Others	Total 1923	Total 1922	Total 1921
Allentown.....	..	..	1	45	35	3	1	1	12	26	124	66	46
Altoona.....	75	2	..	31	59	55	5	13	28	27	295	379	270
Bethlehem.....	..	..	3	12	6	1	..	..	3	12	37	36	22
Easton.....	3	7	3	34	24	1	2	..	7	8	89	48	42
Erie.....	1	..	..	6	32	1	..	..	26	37	103	89	78
Harrisburg.....	38	25	35	59	22	22	..	9	30	112	352	338	305
Johnstown.....	19	..	2	18	39	28	4	4	28	41	183	208	254
Lancaster.....	6	13	6	24	5	4	..	..	7	30	95	38	35
Philadelphia.....	1,569	1,220	1,189	834	1,137	279	150	28	238	1,875	8,519	8,029	7,460
Pittsburgh.....	245	212	239	287	427	1,504	790	278	93	831	4,906	5,009	5,396
Reading.....	78	13	8	79	44	9	5	3	9	39	287	166	196
Scranton.....	88	39	289	105	167	180	24	22	53	191	1,158	1,171	791
Wilkes-Barre.....	106	49	98	88	121	79	17	8	21	147	734	782	573
Williamsport.....	3	..	2	18	16	3	..	..	17	9	68	91	36
York.....	5	1	1	1	2	..	..	1	..	13	24	51	26
Total, 1923.....	2,236	1,581	1,876	1,641	2,130	2,169	998	367	572	3,398	16,974	..	..
Total, 1922.....	3,105	2,091	1,704	2,395	1,808	1,470	283	16	570	3,059	..	16,501	..
Total, 1921.....	2,955	1,083	2,806	1,977	2,445	1,613	46	8	641	1,956	..	..	15,530

*Ibid.

THE PRODUCER'S RETURN

Comparative margins between products handled locally and those shipped to large market centers, as on eggs, apples and potatoes, give some indication of the price advantage to the near-by producer. These prices represent actual transactions within the past few weeks.

EGGS¹

Harrisburg: Producer, Retailer, Consumer

	Dollars	Per Cent
Retailer's margin.....	.05	7.1
Producer receives.....	.65	92.9
Total retail price.....	.70	100.0

New York City: Henney Eggs—Usual Trade Channels

	Dollars	Per Cent
Retailer's margin.....	.15	15.6
Cartage.....	.01	1.0
Commission.....	.04	4.2
Express.....	.02	2.1
Case.....	.01	1.0
Shipper.....	.73	76.0

Total retail price..... .96 99.9

While the percentage of the consumer's dollar received by the producer is 92.9 per cent in the near-by

Harrisburg market and only 76 per cent in the New York market, yet the higher price obtained in New York actually resulted in a better net return to the producer.

POTATOES¹

Harrisburg: Local Stock—Producer, Retailer, Consumer

	Dollars	Per Cent
Retailer's margin.....	.20	16.7
Producer receives.....	1.00	83.3
Total retail price.....	1.20	100.0

POTATOES

Philadelphia: Upper Lehigh Stock—Usual Trade Channels

	Dollars	Per Cent
Retailer's margin.....	.40	30.7
Cartage.....	.04	3.1
Jobber's margin.....	.10	7.7
Commission-man's margin...	.053	4.1
Freight.....	.129	9.9
Shipper's margin.....	.078	6.0
Net to producer.....	.50	38.5

Total retail price..... 1.30 100.0

On a bulky, heavy product of relatively low price such as potatoes, it is evident that shipping to remote markets is real punishment to the producer. In this case the producer received 38.5 per cent of the consumer's dollar, while on the local sale he received 83.3 per cent.

¹ Data furnished by Bureau Markets, Pennsylvania Department of Agriculture.

Apples

*Harrisburg: Stayman No. 1 2½-inch—Producer,
Retailer, Consumer*

	Dollars	Per Cent
Retailer's margin.....	.35	14.0
Package.....	.20	8.0
Net to producer for fruit....	1.95	78.0
Total retail price.....	2.50	100.0

Apples¹

Recent figures U. S. Department of Agriculture on 1922-23 crop of Washington apples; variety, Winesap; grade, Extra Fancy and Fancy combined; sizes 72-163 to unit grocery stores in New York City.

	Dollars	Per Cent
Retailer's margin.....	1.87	37.4
Jobber's margin.....	.49	9.8
Wholesaler's margin.....	.39	7.8
Transportation charges.....	.80	16.0
Shipping organization expense.....	.27	5.4
Packing, package, etc.....	.40	8.0
Net to producer for fruit.....	.78	15.6
Total retail price.....	5.00	100.0

This instance of the prices at Harrisburg is probably typical, while that of northwestern apples shows the extreme handicap of such remote producers. Only a very high price under such circumstance will permit them to continue production.

FUTURE OUTLOOK FOR LOCAL PRODUCERS

In the production of fruit, vegetables, milk, poultry and meat, the

¹Footnote p. 283.

local market's offer decides advantages to the near-by producer. This condition, along with relatively low land values in the East, would seem to point to more adaptation to meet local food needs and a greater appreciation of the opportunity followed by an advance in land values in such areas. A better balance between local production and consumption is in the interest of society as a whole.

There are within 50 miles of the larger centers of population areas that are tenantless or very poorly farmed. Within such local market areas, farms can be bought for the replacement cost of the buildings. Such conditions raise a question of the wisdom of extensive reclamation projects and land settlement developments. Persons who wish to farm would certainly do well to consider the importance of near-by markets, farm improvements, and especially buildings, good roads and opportunity for social enjoyment before investing in some remote piece of arid or swamp land without roads or improvements.

It would also seem desirable from many standpoints for our population to spread out in more moderate-sized centers, within easy reach of extensive food production areas, rather than to further congest in large cities.

A Balanced Agricultural Output in the United States

By W. J. SPILLMAN

Agricultural Economist, U. S. Department of Agriculture

THE purpose of this article is to consider to what extent agricultural conditions in this country may be improved by a better balanced output of farm products. Methods of bringing about this better balance in production will necessarily come in for consideration.

Two of our major crops, and one of our major livestock products, have reached the stage at which increased prices no longer bring about material increases in production. These are cotton, corn and wool.

By 1913 we had reached a provisional maximum acreage of cotton. That year we grew 37 million acres of cotton. Not until 1923 did the acreage again reach so high a figure. While cotton acreage was extending somewhat in the Southwest, and to a slight extent along the northern border of the former cotton growing region, the ravages of the boll weevil along the southern edge of the region reduced acreage sufficiently to more than offset these increases. But increases in the sections mentioned have now reached a point at which the total acreage is beginning to show a slight increase. The amount of this increase, however, cannot be large compared with the present total.

DEVELOPING COTTON ACREAGE

Except for some additional acreage in sections well adapted to cotton in the Southwest, which will be relatively small at best, future increase in the acreage of this crop must come in the main from extension of cotton into sections hitherto not regarded as well adapted to the crop. This will necessarily be a slow process.

Concerning the possibility of increasing the percentage of crop area devoted to cotton in the older cotton territory, not much is to be expected in this direction. Already the proportion of land devoted to cotton in practically all the older cotton growing sections is about as large as it is practicable to make it. Some of the land must be devoted to the growing of food and feed crops, the smaller the yield of cotton per acre the larger the proportion of land in these other crops. The boll weevil has materially reduced the yield of cotton in most districts, so that a larger proportion of land is now in feed crops than was formerly the case in nearly all cotton growing states.

In view of the fact that our production of cotton has not increased materially in a dozen years, while the world's need of cotton has increased greatly during that time, the price of cotton has risen permanently to new high levels. The culture of the crop is now fairly profitable in sections not having the boll weevil, or where this pest can be measurably controlled.

It would appear therefore that, in sections to which the cotton crop is even fairly well adapted, it would be logical to extend the area of the crop, without serious danger of bringing about overproduction.

The possibility that prices as high as those that have prevailed in recent years may lead to the development of cotton growing on a large scale in sections of the world that have hitherto grown little or no cotton must, however, be taken into consideration. At ten cents a pound nations like China could hardly afford to grow cotton,

pay the freight on it to distant markets, and then pay cost of transporting food from other countries. But with cotton at twenty or thirty cents a pound the situation is quite different. Since the rise in the price of cotton, China's exports of cotton have grown amazingly. Australia, Brazil, Argentina, and a very large and as yet unsettled area in eastern Africa are all adapted to the production of cotton. If the price remains high, all these regions may be expected to increase their production till ultimately the world's need of cotton will be fully met.

Developments of the character just mentioned will probably not be rapid. Therefore, it is fair to expect that for some years to come the price of cotton will be remunerative to the grower. While increase in cotton acreage at this time appears to be justified, it would be wise to keep in mind that such increase may not be altogether permanent. In other words, a few years later it will probably be wise to bring about another readjustment that will require a decrease in cotton acreage.

CORN ACREAGE INCREASES

Following the war between the states, our acreage of corn increased steadily until 1912, except for a short period in the eighties, when low prices checked the increase. In 1912 we apparently reached a position of stability in corn acreage. That is, we had by that time completed the settlement of regions well adapted to corn. The acreage of 107 million acres in 1912 has been exceeded only once since that time. That was in 1917, when much land was left unoccupied by the winter killing of nearly a third of the winter wheat acreage.

The December 1 farm price of corn in 1912 was 48.7 cents a bushel. In 1923, with a total production only 3 per cent less than in 1912, the corre-

sponding price was 72.7 cents, and that at a time when we were just emerging from a severe financial depression. This year, with a crop estimated at about two and a half billion bushels, the price is above a dollar, while in 1913, with a crop almost exactly the same size, the price was 69.1 cents a bushel.

The fact that corn acreage no longer responds readily to an increase in the price of corn indicates that we have come to a stage in our agricultural development at which corn is permanently at a higher price level. The need for corn has increased materially since the acreage came to a virtual standstill, and will probably continue to increase.

Under the conditions just described, it would seem that wherever it is feasible to increase the acreage of corn it might be done with safety. That is, the corn grower would still get a fair price for his product.

Such extension is now going on in a small way in the western plains and mountain states. Because of the long distance to market from these sections, whatever corn is produced will probably be consumed locally, and will thus form the basis of a more extended livestock husbandry. It will hardly affect the price of corn in the principal markets.

There is, of course, much land in the Corn Belt still devoted to such crops as wheat, oats and hay. But it does not follow that this means opportunity for marked increase in corn acreage in this region. Corn has profited much less from the invention of labor-saving machinery than have the small grains. One man with a two-horse team can manage about forty acres of corn. With three or four horses he can manage possibly eighty acres on level land free from stones. But this is the limit. On the other hand, with teams of eight,

twelve, or even of eighteen horses, the same man can handle several hundred acres of the small grains provided the harvesting can be done by custom crews, as is usually the case.

Additional corn acreage in the Corn Belt would call for more labor than is now available. Nor is it likely that this additional labor will become available in the near future. We may not, therefore, expect any material increase in corn acreage in this region.

As will be shown later, we are growing an excessive area of wheat. Whatever replacement of wheat with corn is feasible would seem to be desirable. It would tend to correct the evil of overproduction of wheat without materially affecting the status of corn on the markets.

WOOL PRODUCTION

In all the principal wool producing countries of the world, except New Zealand and South Africa, the number of sheep have been decreasing materially for more than a quarter of a century. There has been considerable improvement in the wool-producing capacity of these animals, so that from some time before the beginning of the present century the world's wool production has remained practically constant. But the wool-using population of the world has continued to increase at nearly its former rate. This means wool shortage at the present time as compared with the past.

As a result of the above situation, the price of wool has risen greatly in recent years. It is now nearly three times what it was at the beginning of the century. There is every reason to suppose that wool prices will continue at a higher level than in the past.

We are now importing considerably more than half our wool requirements. As long as we produce materially less of this product than we require, so that

wool must continue to flow in over whatever tariff wall we choose to maintain, prices should remain satisfactory.

Extension of sheep husbandry on farms is difficult, because of trouble from internal parasites, except in our northern border states, and in the Appalachian region. It would therefore appear that there is room for extensive development of sheep husbandry along our northern border. This development is of more than ordinary interest for the reason that the land required for growing forage for the animals may be taken from our already superabundant wheat acreage. Just how much wheat land might thus be utilized cannot now be foretold. It might be considerable.

So far as the wool market is concerned, there appears to be no reason to fear the effect of such increase in production as is likely to occur. The market for mutton and lamb is a different matter. Our people would probably consume all the lamb offered them at reasonable prices. We should probably be driven to finding markets for mutton in European countries, particularly England.

In making material increase in our production of wool, the limiting factor appears to be the possible market for an increased supply of mutton. By keeping close watch on developments in the market for this product, growers of wool will be able to tell when developments have gone far enough.

SUGAR AND VEGETABLE OILS

There are two other farm products of which we produce considerable, but of which we import large quantities. These are sugar and vegetable oils. There is apparently opportunity to increase our production of both these products.

We produce less than a fourth of our

sugar supply. So far as home consumption is concerned, we could therefore more than treble our present acreage of sugar beets without reaching the point of having to export sugar in competition with other countries.

But there are other considerations. We obtain from our island possessions, duty free, a quantity of sugar somewhat greater than our home production. This will probably continue. Hawaii and Porto Rico are not increasing their production, but the Philippines are, and can doubtless greatly increase the magnitude of their sugar industry. Should we give these islands their independence they would presumably come under our tariff restrictions, possibly with some favoring clause such as now applies to Cuba.

A more important consideration is that we are now Cuba's best customer. In fact, we take almost her entire output of sugar. If we were suddenly to enlarge our sugar production to the point that Cuba would no longer have a market here, we should be certain to meet severe competition from that source. But if we increase gradually, so that Cuban producers may at the same time develop markets in other parts of the world, we might greatly enlarge our sugar beet acreage without seriously interfering with the market situation.

It is an important fact that much of the increased acreage of beets might be taken from present wheat acreage, again helping to reduce excessive production of that staple.

It is always possible, of course, that new discoveries in science may change the market situation. The recent discovery of a method of crystallizing corn sugar has greatly stimulated the corn sugar industry. It has already been announced that a method of crystallizing levulose has been discovered. This

very attractive sugar is made from inulin, a substance abundant in the tubers of the Jerusalem artichoke, in dahlia bulbs, and in chicory roots. What influence those discoveries may have on the sugar situation cannot, of course, be predicted. It is, however, advisable for sugar producers to watch developments in these directions.

The manufacture of artificial silk from wood pulp is growing at an enormous rate—from one and a half million pounds in 1913 to thirty-five and a half millions in 1923. The ramie plant also offers a possible substitute for cotton. A method of separating ramie fiber from the stalk, and from the gums and other substances that occur in the bark of the plant, is said to have been developed recently, making it possible to produce this very superior fiber quite cheaply. Both cotton and wool may feel competition from these two sources, but the amount of such competition cannot be estimated beforehand. The best that can be done is to watch the developments and be governed accordingly.

Our imports of vegetable oils, or materials for their manufacture, amounted in 1922-23 to about 600 million pounds. This takes account only of those oils that may be used as substitutes for cotton seed and peanut oil. We could easily grow enough soybeans or peanuts to supply our total requirements for oils of this class. Soybean production is increasing rapidly at the present time, the acreage being estimated at slightly more than two million acres in 1923. It would take three more million acres of this crop to supply the quantity of vegetable oils we now import, or these three million acres might be divided between soybeans and peanuts. The increase in soybean acreage could, to a certain extent, be made at the expense of wheat acreage—a consummation much to be desired.

THE WHEAT SITUATION

Our annual average production of wheat, in millions of bushels by ten-year periods for the past 30 years, has been 643, 681 and 838. This year we produced some 856 million bushels.

Argentine production for the same periods has been 73, 153 and 182 million bushels, and her last crop was 249 millions.

For Australia the figures are 35, 75 and 110 millions, and her last crop was 120 millions.

Canadian production, by five year periods (six years for the first period) for the past 16 years was 183, 248 and 323 million bushels a year, and her 1923 crop amounted to 474 millions.

With conditions such as these staring us in the face, is it not evident that for a generation or more to come the world's need for this cereal will be fully met, and that the price of wheat when crops are normal is to be low—just enough to keep farmers producing wheat? The reason why it would be advantageous to American farmers to reduce their wheat acreage should now be evident.

If by any means we could reduce acreage to the point merely of supplying our own requirements, then it would be possible for growers in this country to get a price for wheat comparable with prices received for most other farm products.

During the past four years we have exported, on the average, about 27 per cent of our wheat crop. The average acreage of the crop during these four years has been 61 million acres. Twenty-seven per cent of 61 millions is sixteen and a half millions. We should thus have to reduce our wheat acreage over 16 million acres, or somewhat more than a fourth, in order to bring production within our own needs. Such a reduction is hardly to be ex-

pected by any means now available. Either some way must be devised for maintaining the price of wheat above the world price level, or farmers must face the necessity of producing wheat at low prices for an indefinite time to come.

THE MINOR CROPS

Oats and hay are grown very largely for consumption on the home farm, small quantities only being grown for sale. The acreage of these two crops quickly adjusts itself to requirements.

All our other crops are grown on much smaller acreage than those already mentioned, the acreage of any one of them being less than one-fourth that of any of the five already discussed. The problem with these small acreage crops is solely that of stabilizing production so that wide price fluctuations may be eliminated, or at least greatly reduced. This problem exists with practically all these crops.

Potatoes will illustrate the situation for the annual crops. The average acreage of this crop for the seven years 1914-20 was 3,841,000 acres. The trend of acreage for a quarter of a century past indicates that for the year 1922 the area needed was about 3,910,000 acres. But in 1921, when other prices were at a very low level, the price of potatoes at the farm on December 1 was \$1.10 a bushel. This relatively high price led farmers to plant 4,307,000 acres of potatoes in the spring of 1922. The acre yield that year happened to be considerably above the average. There was large overproduction, and on December 1 the farm price was only 58.1 cents.

With occasional interruptions due to poor crop years, when yields are much below normal, production of potatoes is up one year and down the next, while the price swings just the other way. During the 16-year period 1900-15, the

price of potatoes fell below cost of production in 8 years.

With long-time crops like apples, the difficulty is accentuated. It takes 8 or more years for young trees to come into commercial production. During a period of low prices, when there has been little or no planting for several years, abandonment of orchards continues till underproduction occurs. Then planting begins, often at a rate far above what is needed. A situation like this occurred late in the first and early in the second decade of this century. For a few years the three states of Idaho, Washington and Oregon alone ordered more trees than were available in all the nurseries of the country. Other apple regions were similarly busy putting out new acreage.

In 1912, enough of the newly planted trees had come into bearing to swamp the markets completely. That year, high class apples sold in the Willamette Valley of Oregon for \$6 a ton. Not only did planting practically cease, but a very large proportion of the trees already in were neglected, and never sent an apple to market. The economic waste in such a course of procedure is appalling.

Broomcorn is another crop that exhibits the evils of frequent over- and under-production. The total acreage of this crop is very small compared with the area well adapted to its culture. Following a year when the price is abnormally high, due to too small an acreage the previous summer, the acreage is greatly extended, frequently into entirely new territory. In the ensuing fall the price is much below cost of production. A community that has been occasionally caught in this way not infrequently abandons the crop altogether. In parts of the Southern Plains region there are broomcorn warehouses that have been empty for years. No broomcorn is grown

near them, nor has been for years, although when they were built the locality was a big producer of broomcorn.

The situation is quite similar with all our fruit and vegetable crops, and with other small acreage crops, such as hops, tobacco, flax and the like.

There is an easy remedy for this entire situation. What is needed is stabilization of acreage at a point that will just suffice to supply the demand for all such products. It would be impossible to fix acreage below this point, for then the price of the product would make it quite profitable, and there would inevitably be such increase in acreage as to swamp the market. But acreage can be stabilized at a point that will bring a fair return to the producer.

The entire trouble arises from the simple fact that at the time the farmer is planting crops of this kind he has no means of knowing what his competitors are doing. In the case of long-time crops like apples, it is easily possible to plant five or six times the average that can ever send its product to market, for it is years after the overplanting is done before the fact is known.

What is needed, then, is a statistical service that will keep growers of all small acreage crops fully informed at all times as to what is happening in all localities that compete with them. Growers should be fully informed as to what acreage of a given crop is needed to meet reasonable market requirements, and how much of this acreage is normally grown in each marketing zone. By a marketing zone is meant a region sending its product to market at approximately the same time. When planting time comes in any zone, growers should be informed as to what percentage of a normal planting has been made in all the zones to the southward. It would, indeed, be possible

with proper organization to get this information to growers almost daily during the critical period of planting, so that each grower would know whether he is helping to overplant or underplant a particular crop.

This would never lead to underplanting. If a grower knew at planting time that less of his crop has been planted than the markets require, he would inevitably increase his acreage. It is presumed that if he knew the crop was being overplanted he would reduce his intended plantings.

It seems fair to say that a system of reporting such as here suggested would be of enormous value to farmers, and it would not be disadvantageous to any one.

LIVESTOCK PRODUCTS

For several years past the beef cattle industry has suffered severely from low prices, and the end is not yet in sight. The war stimulated this industry tremendously, and the number of beef cattle, although decreasing steadily for some time, seems yet to be far above market requirements. At least the markets are getting plentiful supplies at prices that are wellnigh ruinous to growers. Before much betterment can be expected there must be a material reduction in the number of breeding stock on farms and ranges.

The fact that sheep have been decreasing in numbers materially for more than a quarter of a century in nearly all the leading sheep-growing nations, resulting in a marked rise in the price of wool, appears to indicate that a change from beef cattle to sheep in a good many localities might be advisable. This change should not be made hastily. If it could be brought about gradually, so that it could be stopped before the price of sheep began to be seriously affected, it should result in an increase in the price of beef cattle

without much danger to the sheep interests.

Dairy products have maintained their price fairly well since the war. The reason for this is to be sought in changes that have come to Corn Belt agriculture. When corn was 50 cents a bushel, and hogs 5 cents a pound, the Corn Belt farmer needed to milk a few cows to make ends meet. In 1909 Iowa was the leading state in the production of butter. But most of the Iowa cows were of the dual purpose type. When corn went to 80 cents, and hogs to 8 cents a pound, Iowa farmers could do very well without milking cows. During the last census period (1909-19) this state decreased its milk production 26.3 per cent. Adjacent parts of other states did likewise. The decrease for the whole of Nebraska was 15 per cent, and for Illinois it was 7 per cent. This was formerly one of our most important dairy regions. The tremendous decrease in milk and butter production here made room for large expansion in dairying in the states to the north and west. The increase in the latter states between 1909 and 1919 was heavy. Yet the vacancy left by the Corn Belt made room for all this increased production elsewhere.

At present beef cattle and hogs are below parity with corn, and Corn Belt farmers for some time past have been turning to dairying again. This is the wrong course of action for them. If they go back to milk production on the former scale, they will not only make hardship for the regions compelled by absence of cheap corn to engage in dairying, but they will lower the price of butter to the point that they themselves will earn little for their labor.

The more logical thing for Corn Belt farmers to do is to adjust the number of beef cattle and hogs to the market

demand, so that they will get a fair price for the products to which the region is best adapted. Here again, a statistical service that will keep stockmen properly informed is needed. We should know at all times how much stock of all kinds are at hand in all sections of the country where livestock are important, and how many should be on hand in order to meet market requirements. What is needed in the case of beef cattle and hogs is stabilization of production at a point that will supply the market at a living price to the producer. This could be accomplished with an adequate statistical service.

Poultrymen are confronted by threatened overproduction on the part of the small to medium sized farm flock. This is due to the recent improvement in farm flocks through culling. Where farmers formerly kept 100 hens, only 60 per cent of which laid any eggs, the more progressive farmers now keep 150 hens all of which lay eggs. Here again stabilization is the remedy. With a statistical service that would enable every poultryman to know just what is going on in the poultry world at all times, he could adjust his business to suit his market outlet.

SUMMARY

This survey indicates that the acreage of cotton, corn, sugar beets, and oil producing crops such as soybeans and peanuts might be increased moderately without seriously endangering present fairly good prices. Production of wool might similarly be increased considerably with safety.

Our acreage of wheat is about 27 per cent more than is necessary to

supply our home needs. There is little probability that the acreage can be reduced to this extent. Some plan of preventing export wheat from controlling the price of the home used product is necessary if the price of wheat is to be brought to a par with that of other farm products.

What is needed in the case of the small acreage crops, and in the case of most livestock products, is a universal statistical service that will enable producers to know at all times just how much they are helping to over- or under-produce. This will enable them to adjust their production at a point that will reduce price fluctuation to a minimum, and greatly lessen the economic waste from frequent over- and under-production.

Some reduction in the number of beef cattle in favor of sheep, especially in the states along our northern border, appears to be desirable.

The enormous increase in agricultural production during the war demonstrated that, when conditions justify, American farmers can greatly increase the production of most farm products. Cotton and corn, and possibly wool, are about the only farm products we would find it difficult to produce more of than the markets would take. Except for the products just mentioned and a few others mentioned earlier in this article, it appears probable that it will be many years before we reach the point where production will fall far behind our needs. This makes it all the more desirable that some such measures as those herein suggested be undertaken as a means of better enabling farmers to obtain their fair share of the national wealth.

Book Department

WALLACE, WILLIAM KAY. *The Passing of Politics*. Pp. 328. Price, \$4.50. New York: The Macmillan Company.

The thesis of this book is that the political organization of society and the political point of view have outlived their usefulness and are to be replaced by an economic organization of society and a social viewpoint. The author holds that politics, like war, is a struggle for power; and that politics replaced war, at the close of the Middle Ages, as an indirect means of accomplishing the ends of the national groups then arising. In this process war was made subservient to politics, and the aristocratic system which was natural in a régime of war was replaced by a democratic political system, which was a backward step and marked the decay of the existing civilization. The rise of politics and diplomacy as the method of settling disputes led to attempts to rationalize and philosophize, and to theoretical speculation concerning the state based on a *a priori* dogmas.

With the "method of philosophy," in which dogmatism, speculation and the mystical intuition hold sway, and which the author believes to be inevitably associated with politics, he contrasts "the method of history," in which events speak for themselves. By the application of scientific, historical methods, politics will be replaced by industrialism as the cohesive force in social life. The state is viewed as an obstacle to progress, representing an outgrown, individualistic, middle-class point of view. The new groups represent economic classes, are interested in problems of industrial efficiency, and are agencies working for the disintegration of politics.

The book is stimulating and suggestive, though the thoughtful reader is constantly inclined to quarrel with its generalizations of history and with its conclusions. It represents a phase of the present-day attack upon the state and upon democracy, and shows decided traces of the modern psychological influence on political theory

and of the pluralistic doctrines of guild socialism. To the reviewer, the author's assumption that political philosophy is always *a priori*, and his contrast between the "method of history" and the "method of political philosophy" seems unsound, since political theory represents the intellectual atmosphere of its times and is constantly influenced by the actual institutions of its own day.

RAYMOND G. GETTELL.

ANONYMOUS. *Behind the Scenes in Politics—A Confession*. Pp. 308. New York: E. P. Dutton & Company.

It is unfortunate that this book is anonymous. There is certainly nothing in it that would make the author feel he should conceal his identity. Whether the author has really been the part in public life he says he has been, or whether this is stage business to sell the book, does not appear. The book could have been written by any newspaper reporter who had followed presidential tours around the circle in the past dozen or fifteen years.

The book is interesting. There is an effort apparent on every page toward brilliancy in style, and that brilliancy in style occasionally gets in the way of the thought. The book is full of human interest and is of real value to every student of politics. When the current craze for anonymous books passes someone who has gone through the mill should write just such a book in his own name replete with examples and illustrations.

MELLON, ANDREW W. *Taxation: The People's Business*. Pp. 229. Price, \$1.25. New York: The MacMillan Company, 1924.

Someone has well said that we write our philosophies to justify what we do and do not make our philosophies to guide our actions. The people cut off the head of their king, then someone writes a book creating a philosophy justifying the beheading! For centuries thereafter that

philosophy is used to justify anything else the populus wants to do.

This book by the Secretary of the Treasury gives a philosophy that justifies what the Secretary of the Treasury wants done. That philosophy is largely a personal one. In order to bolster it up poor old Adam Smith is lugged in as are all the other respectables and a sufficient twist given to their ideas to make a one-night stand for the philosophy of the hard pushed.

WRIGHT, PHILIP G. *Sugar in Relation to the Tariff*. Pp. xiii, 312. Price, \$2.50. (Publication of the Institute of Economics.) New York: McGraw-Hill Book Company, 1924.

This excellent study by the Institute of Economics is the first of a series of special investigations of the relation of the tariff to particular lines of production, preparatory to "an analysis and constructive criticism of the American tariff system as a whole."

The writer of the work under consideration studied sugar costs and tariffs several years for the United States Tariff Commission before going over to the staff of the Institute. This monograph is essentially a summary of the data gathered by that Commission and co-operating Federal agencies—particularly the Federal Trade Commission and the Department of Agriculture and Commerce—together with conclusions drawn therefrom. The findings are not merely those of a single author, albeit an unusually well-qualified one, but also of the Council of the Institute, a body which has a personnel and a freedom from political and pecuniary pressure which relieve the reader of the common suspicion of "interested" motives.

The most striking factual data presented are the diagrams of output and cost of sugar production, factory by factory, for specified years in Cuba, Hawaii, Porto Rico, Louisiana and the domestic beet-sugar area. By means of these diagrams it is comparatively easy for "him who runs" to visualize approximately what proportion of the production in each field would be eliminated and what proportion would survive if certain specified prices prevailed. It is clear that much of the domestic beet

sugar is produced more cheaply than the bulk of Cuban sugar but that some of it costs much more. Louisiana, Hawaii and Porto Rico, in order, produce smaller proportions of low cost sugars that could survive Cuban competition without tariff protection. Mr. Wright estimates, on the basis of 1921 and 1922 data, that the percentages of domestic industry that could survive free sugar would be approximately:

Domestic beet sugar.....	66%
Hawaiian cane sugar.....	40%
Porto Rican cane sugar.....	30%
Louisiana cane sugar.....	42%

Following are summaries of some of the other conclusions:

The annual burden of the present United States sugar tariff upon consumers is about \$216,500,000 of which \$124,500,000 goes as revenue into the Treasury and \$92,000,000 is the taxpayers' contribution to "protection."

Any tariff, however low or high, will, in the course of years if not changed in the meantime, result in stabilized sugar industries, both at home and in Cuba (our only important source of imported sugar) because marginal costs and production are adjusted to prices obtainable. Consequently, in deciding whether or not to adopt the recommendations of the Tariff Commission majority report favoring a lower tariff, President Coolidge is really deciding matters of policy, namely, what proportion of our total consumption shall be furnished by domestic producers and what proportion by Cuban; what part of our revenue shall come from people in proportion to their consumption of sugar and what part in proportion to some other criterion of taxpaying obligation; how much consumers shall subsidize domestic producers or how much they shall favor American seaboard refiners and investors in Cuban sugar plants. The impossibility of taking the tariff out of politics is evident to anyone who thinks.

If the President tries to follow the mandate of the 1922 tariff to fix the rate so as to equalize domestic and foreign costs, no rate he can name will equalize the costs of more than a small fraction of domestic

and foreign factories because costs vary with every factory at home and abroad. On the other hand, any rate he fixes, if left unchanged, will ultimately stabilize the sugar industry. The effective prewar tariff upon Cuban sugar was 1.0048 cents per pound. The domestic and Cuban industries have not yet completed their adjustment to the existing effective rate of 1.7648 cents. Mr. Wright estimates that stabilization at the present status—that is, without much injury to vested interests, on the one hand, or without much encouragement to rapid expansion, on the other hand—could be brought about by a rate of from 1.25 to 1.50 cents per pound.

Viewed from another angle, the problem is that of determining how great a degree of ineffectiveness in production and how great a burden upon consumers may properly be offset by increased national self-sufficiency.

So long as we have a tariff, for either revenue or protection, continues the author, there are strong reasons for keeping sugar on the dutiable list. It is highly productive of revenue and diffuses the burden widely. A sudden reversal of policy would seriously affect vested interests which have long received not only protection but special encouragement by the government. Beet culture improves the soil and a strong sugar industry promotes national self-sufficiency. On the other hand, excessive duties violate the vested interests of American seaboard refiners and investors in Cuban sugar lands and plants; furthermore, every advance in the rate tends to increase the burden upon consumers without a proportionate increase in revenue and it also induces less effective producers to enter this field, and they in time become vested interests and demand continued protection of their ineffectiveness.

The existing rate (1.7648) appears unnecessarily high. The present is a favorable time for making a reduction.

The high range of prices—much above marginal costs (see p. 134)—makes it possible to effect a substantial reduction in the rate, resulting in some relief to consumers without imperiling any branch of domestic industry.

ROY G. BLAKEY.

MATHEWS, JOHN MABRY. *American State Government*. Pp. xv, 660. Price, \$3.75. New York: D. Appleton & Company, 1924.

Whatever may be thought of Professor Freund's view, that "states will have to be content with what cities enjoy under constitutional home rule," interest in the American Commonwealth shows no present sign of subsidence, and this well-written volume by Professor Mathews will undoubtedly do much to stimulate even greater interest in the field.

Those who have profited by Professor Mathews' earlier work on *State Administration* will find again in this book the same admirable qualities of logical arrangement, clarity in expression, and breadth of bibliographical references. The volume opens with an account of the place of the states in the Union, works through the state constitution to methods of popular control, and then describes in turn the legislature, the executive, the administration, and the courts, concluding with a chapter on the state and local government. Appendices contain, among other items, the "Model State Constitution," the "Hare System of Proportional Representation," and summaries of local government problems. The most noteworthy achievement in the handling of the available space is perhaps the recognition of the importance of administration in a general survey of state government.

Opinions will naturally differ concerning the space to allot to the many aspects of state government. One may perhaps express regret that the far-reaching device of Federal grants-in-aid to the states was dismissed with two sentences (p. 71) and that the mechanism of central fiscal control of departmental expenditures was not further developed. One misses also a comprehensive account of the constitutional convention. Professor Mathews' philosophy of the commonwealth government would have been of great interest and value; we need not only descriptions but evaluations of this distinctively American institution.

The work of general analysis of state government, commenced by Holcombe a decade ago and carried on by Dodd, would

now seem to be completed by this work. It is much to be hoped that the next decade will see primarily the production of a series of careful monographs, to fill "the many gaps in our knowledge of the working of state governmental processes" to which the author refers.

LEONARD D. WHITE.

YVES-GUYOT. *Politique Parlementaire et Politique Atavique*. Pp. 426. 12 frs. 50. Paris: Librairie Félix Alcan, 1924.

M. Yves-Guyot is a well-known French publicist, author of a long series of works on government and politics and editor of the *Journal des Economistes*. To his study of contemporary questions he brings the experience gained during a service of eight years as Deputy and three years spent as Minister of Public Works.

The first half of the book deals with the *politique parlementaire*, or form of government as prescribed by the French constitution. He discusses here such topics as the method of electing the President and his powers, the functions and responsibilities of the Ministers, the rôle of the Prime Minister, the choice of Senators and their functions, and the reasons for the weakness and unpopularity of the Chamber of Deputies. The American reader will be especially interested in the frequent parallels that are drawn with our own and the British systems of government of which the author shows an intimate and first-hand knowledge. He is a firm believer in the principle of strong centralized authority, and regards as a source of weakness a number of provisions in the American and French constitutions which others may consider necessary safeguards against an abuse of power.

But constitutional government with all its defects is far preferable, says the author, to a *politique atavique*, of whatever character it may be, and by *politique atavique*, he means principles in vogue during the Ancien Régime which were scrapped by the National Assembly of 1789, and which are again being advocated. The partisans of this atavistic form of government are made up of two widely dissimilar groups, the monarchists on the one hand, and the socialists, radical-socialists, and commu-

nists, on the other, but they have one common bond; namely, a desire to replace the present government of France by a system based upon exploded political and economic theories.

The author apparently does not believe that the monarchists constitute a serious menace and therefore gives scant consideration to the sophistries of M. Charles Maurras and to the antics of M. Léon Daudet. His guns are trained against the socialists of various hues and the communists, and he makes a searching analysis of their platforms and their programs of social legislation.

In this latter portion of the book we must not look for an impersonal interpretation of facts. M. Yves-Guyot has an intense personal bias—a bias which he would freely confess. Whether one agrees with all of his conclusions or not, the book will prove of interest to those who wish to inform themselves regarding current political movements in France.

NOWAK, KARL FRIEDRICH. *The Collapse of Central Europe*. Pp. viii, 365. Price, \$8.00. New York: E. P. Dutton & Company.

Viscount Haldane writes a brief introduction to Dr. Nowak's book, in which he characterizes it as brilliant, striking, profoundly interesting and full of living force. Such statements are strong, but are not an exaggeration as applied to this volume. It is carefully written with the caution and discrimination of the trained historian, while its literary quality is high, holding the reader's attention closely from beginning to end. No doubt a large portion of its literary excellence is due to the able work of the translators, Messrs. P. Lochner and E. W. Dickes.

The period covered is that from late 1917 until the days just before the Armistice in November, 1918—about a year. As the title indicates, only Central Europe is considered, which means Germany, Austria and Bulgaria. Turkey is not included. In spite of the close inter-relationship of events in the different countries, a fact that makes clear narration difficult, the description of events has been skillfully handled, with a minimum of repetition.

Beginning with Brest Litovsk, we are carried along through the growing weakness of the Dual Empire, the increased pressure on the Western front, attempts at peace under Austrian initiative, the collapse of Bulgaria and its effect on her allies, particularly Austria, and the growing demoralization and hesitation in Germany. Then comes the disintegration of Austria, encouraged by a program of leniency and culminating in the publication of the Manifesto of Emperor Charles on October 17. In the last three chapters the influence exerted by the spread of new ideas throughout Germany and Austria is effectively pictured.

A reader finishes the volume with many reactions, some of which will be determined by his own interests and temperament. To the present reviewer several impressions stand out above others.

One is the overwhelming evidence of the vacillating attitude of General Ludendorff. Dr. Nowak may be entirely accurate in attributing this attitude to a poor memory or "a case of nerves." We do not know. But no matter whether it was nerves, poor memory or something worse, the consequences to Germany were appalling, and for the rest of the world almost as serious. At Brest Litovsk, at Kreugnach and at Spa his wavering, changeable and contradictory expressions confused his associates and made the approach to peace slower and more difficult.

During 1918, says the author, "two evangels, which no armed force could stop, had spread among the masses, crossing the frontiers of the Central Powers. They came from the east and the west." One was the call of Lenin and Trotsky, while from the west came the voice of President Wilson. "Lenin in the east was primarily an apostle of the rights to the material fruits of the earth, which he sought to divide among hungry followers. Wilson in the west was a prophet who wished to build realms of law-abiding harmony for nations that were no longer to need arms. . . . The prophets from east and west stood in sharp opposition to each other. For Wilson was not merely fighting on behalf of a fraternal league of peace of the peoples. He was also fighting for business

and trade, as the spokesman and avenger of powerful industries which had been injured and their markets meddled with. On him, above all, Prophet Lenin declared war to the knife."

These are but two references to which could be added numerous others. At the end of the volume are a number of appendices which present leading documents of importance in the narrative.

ERNEST MINOR PATTERSON.

MACARTNEY, MAXWELL H. *Five Years of European Chaos*. Pp. 242. Price, \$4.00. New York: E. P. Dutton & Company, 1923.

In this interesting volume, Mr. Macartney, a special correspondent of the *London Times*, has given us the results of his observations and experiences in Europe since the Armistice.

His first chapter deals with the fundamental errors of the French and tells us the reasons for the "European chaos" at the end of five years of so-called peace. For these conditions of chaos and instability, he holds the Paris treaties to be mainly, though not exclusively, responsible. A great deal is due to the effects of the Great War itself, and to the shortsighted policies that have dictated the conduct of the various governments, more particularly that of the French, since the war.

In the succeeding eight chapters, the author describes his experiences in Hungary during the four months' period of Bolshevik rule: "Austria's Fight for Life," "Kaiser Karl's Bid for His Throne," "The Upper Silesian Muddle," "The Rebirth of German Unity," "The Irish Controversy," "King Constantine's Second Flight" from Greece, and "The Fall of the Sultan" of Turkey.

Though the student will look in vain for anything like a thorough treatment of any of the above events, the general reader cannot fail to find both entertainment and instruction in the illumination which Mr. Macartney is often able to throw upon his subject by the narration of personal experiences. Particularly interesting are his characterizations of Bela Kun, the account of the wild efforts of the Emperor Charles

to regain his lost throne, and his description of the Irish Parliament.

Though not wanting as a source of knowledge, on the whole the book is one calculated to entertain rather than to instruct the serious student.

AMOS S. HERSHEY

GOING, CHARLES BUXTON. *David Wilmot, Free Soiler*. Pp. xvii, 787. Price, \$6.00. New York and London: D. Appleton & Company, 1924. Illustrated.

David Wilmot is well known as the proponent of the "Wilmot Proviso," but not as the Pennsylvania politician, jurist, charter member of the Republican party, near-member of Lincoln's cabinet, senator during the early part of the Civil War and judge in the United States Court of Claims. Mr. Going's volume tells it all.

Unhappily, Wilmot's private papers have been lost, so that the author has been compelled to rely on Wilmot's published speeches, and on newspapers and other secondary sources for his raw material. The volume lacks, therefore, any intimate and personal touch. Of Wilmot's political views and career, Mr. Going has given us a full account; of his domestic and private life, hardly a glimpse. An appendix of 130 pages gives at length some of Wilmot's more important speeches. The volume is well buttressed throughout with references and selections from documents and speeches.

The central feature of Mr. Going's account is, of course, the origin and history of the Proviso, of which the author believes Wilmot to have been the prime mover. The details are given—too many in fact. There are so many selections from the remarks of speakers on all sides of the question, that the whole becomes a bit tiresome to the ordinary reader. For the specialist in history such detail is more defensible. The story of the other parts of Wilmot's career moves far more briskly.

The view of Webster's Seventh of March speech, which Mr. Going takes, is that of Senator Lodge's *Daniel Webster*. Later students of that much debated speech have been inclined to give Webster credit for a greater degree of sincerity.

On the whole, the volume is a solid, scholarly presentation of the public life

of David Wilmot, but would "carry" better if compressed into much shorter compass.

CHARLES R. LINGLEY.

BLACHLY, FREDERICK F., Ph.D., and OATMAN, MIRIAM E., M.A. *The Government of Oklahoma*. Pp. vii, 678. Oklahoma City: Harlow Publishing Company, 1924.

This volume aims, first, to furnish an informational basis for a wide and intelligent discussion of the government of the state of Oklahoma, and, second, to suggest ways and means which should be considered in working for its improvement. The method of the authors has been to analyze the substance of complicated and detailed constitutional provisions, to outline numerous legislative enactments, to interpret a multitude of judicial decisions, and finally to subject to careful scrutiny the daily operations of the governmental mechanism.

Among the impediments to governmental efficiency enumerated are excessive constitutionalism, the popular election of many state officers, an incorrect relationship of the executive to the legislature, wrong administrative organization in the state government, decentralization in local government without any adequate administrative supervision, the absence of well-co-ordinated supervision in municipal government, the lack of civil service methods, and a decentralized judicial system. The remedial measures advocated include fundamental and sweeping changes. The authors recommend either an elected or appointed executive, but essentially an executive "provided with some way by which he may definitely initiate laws, fight for them in the legislature, and resign or call a new election in case the legislature refuses to pass them." They also propose a reorganized administrative system, eliminating a dozen elected constitutional officers, and consolidating the seventy-five officers, boards and commissions into a dozen major departments directly under the control of the governor. Other changes suggested are a more simple constitution, a redistribution of functions between the state and its subdivisions, a broader grant of power to municipalities, the creation of a local government department in the

state government, and the consolidation of all the courts into one general court of judicature.

The authors have subjected the state government to a thorough analysis in the light of certain principles of political science and "dogmas of administrative reform" which have become axiomatic. One may seriously question, however, the practical value and efficacy of a number of the remedial measures set forth. In their eagerness for concentration of power and centralization of responsibility in the hands of the executive, the writers neglect the important element of continuity in administration. The arrangement of the material and the technical treatment of the subject matter impair considerably the utility of the study as a popular treatise. It has distinctive merit, however, as a scientific analysis of a governmental mechanism in operation. The student, the administrator, and the interested layman will recognize it as a valuable contribution to the accumulating materials in the field of state government.

MARTIN L. FAUST.

Philadelphia's Government—Bureau of Municipal Research of Philadelphia, 1924. Pp. 39.

The Philadelphia Bureau of Municipal Research has performed a real service for students of municipal government by preparing a brief but complete description, almost in outline form, of the city's governmental structure. Philadelphia is a typical American city in things governmental. Some liberalizing influences have crept in surreptitiously. The old bicameral council, for example, has become a small, single-chambered body of twenty members. On the other hand, such "radical" reforms as the short ballot have made little progress. Seventy-one administrative and judicial officers are still chosen by the voters of the city at large.

Every unit of the city's organization is accorded "honorable mention" in the pamphlet, but no official or board from the mayor to the mythical commission on city planning is given more than a few sentences. Perhaps the most interesting and illuminative phase of the report is the

accompanying chart, which has been prepared with great care, and presents an excellent picture of Philadelphia's government. Copies of the pamphlet may be secured without cost by writing to the Bureau of Municipal Research.

A. F. M.

CONOVER, MILTON. *Working Manual of Original Sources in American Government*. Pp. 135. Price, \$1.50. Baltimore: The Johns Hopkins Press, 1924.

This volume is for classroom use as a supplement to collegiate textbooks on American government. It is divided into seventeen chapters each of which states a problem in the general field of original sources in the American Federal System: One chapter is devoted to the Constitution, one to the State Government, one to the City Government, one to Local Government; three chapters are devoted to the electorate, and ten to the national government. In addition to the given problem in each chapter there are fifty assignments in primary sources on the topic being investigated. These assignments have been adapted to the congressional set of public documents found in libraries that are depositories of the national government. There are also a series of suggestive questions that will guide the student in his work and a list of references to the more important secondary sources in each particular field.

The author hopes "that eventually the project method of teaching American government may be employed in much the same manner as in the case method in the teaching of law." A judicious use of his book will surely add a certain desirable freshness to the average course in government.

The Labor Party's Aim—Seven Members of the Labor Party. Pp. 95. The Macmillan Company, 1924.

These essays are a theoretical examination of the basic ideas of socialism, written anonymously by seven members of the British Labor Party. The authors first clear away the driftwood of the past that no longer corresponds to present-day social facts in an everchanging world; they then

outline in general what they consider would be an intelligent course of action in the face of actual conditions, and state the aims of the labor party for the future, in chapters that deal with the international ideal, the economic basis of a labor policy, government in a labor state, and the individual in the labor state.

They display the customary impatience of the idealists with compromising or temporizing of any sort, and criticise in part some of the outstanding leaders in their political faith, both past and present.

W. E. HEITLAND. *Behind and Before*. Pp. 165. Cambridge University Press, 1924.

The author is deeply interested in the shortcomings of popular government, and the lack of trained intelligence in those who administer it. In the first of two essays that appear in this volume he points out the importance of a knowledge of history to active citizens, and the wisest manner in which this knowledge may be used. In the second essay he examines certain writings of eugenists, for, as he says, "if we recognize human nature as a dominant force in politics, the biological view of men and their possibilities must surely be instructive." He suggests that the necessary improvements in popular government can be made, but that delay is making our problems increasingly difficult, and that reason is not enough to enable the majority of citizens to overcome the obstacles ahead;—the emotional influence of religion is also needed—religion in a broad and catholic sense.

JOSEPH K. HART. *Social Life and Institutions: An Elementary Study of Society*. Pp. 423. Yonkers-on-Hudson: World Book Company, 1924.

This elementary text-book gives definite expression to a movement in the teaching of sociology from which important results are to be expected.

So long as the abstract term "Sociology" retains its dominant position in thought and teaching, the instructor will be forced to spend valuable time at the beginning of a course in defining "the field of sociology," and in discussing the relation of "sociology"

to "economics," "anthropology," "history," and other subjects. A sound policy in instruction demands that the student, whether in school or college, should be introduced at the outset, not to theoretical distinctions, but to the materials and problems which are characteristic of the particular subject to be taken up.

In the title of this book, the author has indicated clearly the source of most of the difficulties which have embarrassed students of society. He has pointed out the significant fact that the study of society is concerned, not with "Sociology," but with social life and social institutions.

Furthermore, Professor Hart has perceived clearly that the point of departure in the study of institutions must necessarily be a recognition of the *differences* presented to us by an initial survey of mankind or of any specific group.

It is to be regretted, however, that at this point the author's keen appreciation of the needs in the study of society has not been proof against the established conventions of sociological writing. Instead of keeping steadily in mind that the subject of his inquiry is "society," he has fallen back upon the precedents of the 17th century and has initiated his presentation with a discussion of "individual differences." It should have been obvious to Professor Hart that the study of society must necessarily begin with a discussion of differences in social groups. This lapse has cost the author the distinction of giving us a book which would have marked a new and vital departure in sociological study.

FREDERICK J. TEGGART.

GORDON, WALHAM D., and LOCKWOOD, JEREMIAH. *Modern Accounting Systems*. Pp. 464. Price, \$4.00. John Wiley & Sons, 1924.

Modern Accounting Systems, by Professors W. D. Gordon and Jeremiah Lockwood, is the first volume to appear in the Wiley accounting series edited by Professor H. T. Scovill, and if the other volumes of the series are up to the standards set by this book, a very marked contribution will have been made to accounting literature. So many books have appeared in recent years which are simply restate-

ments of generally acknowledged principles that it is decidedly refreshing to see an accounting text depart from such routine and pioneer in a new field.

In the words of the authors, "the purpose of this book is to study the application of accounting principles in detail to various types of industry." A review of the book shows that the accounting systems of the following industries or organizations are considered: Building and Loan Associations, Fire Insurance Companies, Life Insurance Companies, Banks, Brokerages, Department Stores, Gas Companies, Railroads and Municipalities.

One or more chapters precede the discussion of an accounting system for each of the industries just named. These chapters in general detail the purpose, organization, operating procedure, and the chief problems of the industries for which accounting systems are presented. It would be apparent to all who read these descriptive chapters, or even sections of them, that the accounting system provided for each business must recognize and provide for the characteristics of each business.

The accounting systems described and illustrated cover special books of original entry, entries to be made therein, and the form and content of the annual reports or statements. Undoubtedly there would be a difference of opinion between accountants as to the exact way in which certain details might best be treated. It should be remembered that for many of the industries included in this book certain departments of the state or Federal governments have prescribed either the classification of accounts, or the details as to the content and form of the statements, or both.

The book is well written and the illustrations of books, entries, etc., are well chosen. Thirty-four problems are included in the book, divided between the various subjects discussed. In four cases, model solutions are given by the authors.

The section of the text dealing with municipalities is an unusually good summary of some of the chief problems involved in the accounting systems of cities. However, the inclusion of a subject of this type might be questioned when so many of our institutions are offering separate courses in Governmental Accounting.

From the standpoint of use as a text, *Modern Accounting Systems* is obviously intended for use in advanced accounting courses where a thorough knowledge of accounting principles is assumed. Additional problem material might easily be supplied by the instructor if more laboratory work seemed desirable.

All in all, *Modern Accounting Systems* is a book which should be in the library of every person interested in accounting—student, instructor, professional accountant and business man.

F. H. ELWELL.

LUTZ, HARLEY L. *Public Finance*. Pp. xvi, 681. New York and London: D. Appleton & Company, 1924.

This book covers the whole field of public finance in the traditional way. There is nothing extraordinary about either its content or substance. The book, however, is by all odds the best handbook on public finance now in print. The text is clear and the style is direct.

FISHER, IRVING. *America's Interest in World Peace*. Pp. 123. Price, \$.60. Funk & Wagnals Company, 1924.

MARRIOTT, SIR JOHN A. R. *The English Constitution in Transition, 1910-24*. Pp. 40. Price, \$.50. New York: Oxford University Press, American Branch.

DURKHEIM, EMILE. *Les Regles de la Méthode Sociologique*. Pp. 186. Price, 7 francs. Paris: Librairie Félix Alcan, 1924.

Index

- AGRICULTURAL CREDIT FACILITIES—ARE THEY AMPLE?** A. D. Welton, 69-77.
- AGRICULTURAL SITUATION AS VIEWED BY A WESTERN SENATOR, THE.** Arthur Capper, 121-3.
- Agriculture:** advertising in, 255; Congress, help of, to, 122; depression, 55; gravity of, 156; factors in, 38; expansion, effects of, 49; government interference in, 126; income, changes in, 27; national program, suggested, 125-8; need for adjustment of production, 124; overproduction, acute situation from, 121; Pennsylvania, percentage engaged in, 279; prewar conditions in, 166; production costs, 5-7; prosperity in, 1-5; relating production to consumption, 121; wartime influence on, 21, 22.
- AMERICAN FARMER AND THE TARIFF, THE.** Charles W. Holman, 166-76.
- Automobile Insurance Company of Hartford,** 106.
- BALANCED AGRICULTURAL OUTPUT IN THE UNITED STATES,** A. W. J. Spillman, 285-92.
- BALDERSTON, R. W.** Marketing Fluid Milk in Philadelphia—An Experience in Sales Co-operation, 231-42.
- Banking organization, U. S. changes in,** 69.
- BEAN, L. H. and O. C. STINE.** Income from Agricultural Production, 27-34.
- Beef, export of,** 148.
- BLACK, JOHN D. and H. BRUCE PRICE.** Costs and Margins in Marketing, 184-200.
- BRANNEN, C. O.** Taxes in Relation to Earnings of Farm Real Estate, 41-4.
- CAPPER, ARTHUR.** The Agricultural Situation as Viewed by a Western Senator, 121-3.
- Census reports, percentages of employed,** 56.
- Child labor, Federal restriction of,** 59.
- Colleges, agricultural,** 88; influence of, 93; work in, 90.
- Conferences between milk producers and dealers, results,** 233-5.
- Co-operation, improved marketing service through,** 213-16; reduced costs through, 212.
- Co-operative: companies, kind and amount of business of,** 202-6; legislation, early efforts among farmers, 227; functioning of, 227-30; marketing: benefits of, 206; financial and non-financial, 208; growth of, 201; limitations of, 224-6; possibilities of, 217-24.
- Corn, developing acreage of,** 286.
- COSTS AND MARGINS IN MARKETING.** John D. Black and H. Bruce Price, 184-200.
- Cost and Margin studies, methods of,** 184; survey of, 194-8.
- Cotton, developing acreage of,** 285; U. S. production of, 142-5.
- COULTER, JOHN LEE.** Extending Farm Diversification Westward and Northwestward Into the Great Plains Region and the Spring Wheat Area, 258-64.
- Credit crop insurance, cases of,** 107; facilities, need for improved, 84.
- CROP INSURANCE—ITS RECENT ACCOMPLISHMENTS AND ITS POSSIBILITIES.** G. Wright Hoffman, 94-120.
- Crops and livestock, choosing, experiments in,** 80, 81.
- Cropper farmer, problem of,** 65; system, 63.
- Debt, land mortgage, increase in,** 65; influence of on export trade, 150-2; payment of, 150.
- DOMESTIC MARKET FOR AMERICAN FARM PRODUCTS,** A. L. C. Gray, 156-65.
- Economic condition, U. S. future,** 161.
- ERDMAN, H. E.** Possibilities and Limitations of Co-operative Marketing, 217-26.
- Europe, present status and other countries,** 135-42.
- Experiment, earliest in crop insurance,** 99; station, agricultural work of, 92.
- Exports, agricultural, condition of,** 142-52, 162-4; decline, causes of, 156, 157; domestic farm increase in, 129; farm, trends in, 131.
- Extension work, Federal and state,** 88.
- EXTENDING FARM DIVERSIFICATION WESTWARD AND NORTHWESTWARD INTO THE GREAT PLAINS REGION AND THE SPRING WHEAT AREA.** John Lee Coulter, 258-64.
- EXTENT OF CO-OPERATIVE MARKETING AMONG FARMERS TODAY AND THE RESULTS SECURED BY CO-OPERATIVE ASSOCIATIONS, THE.** Benjamin H. Hibbard, 201-7.
- FARMERS AS MANAGERS.** W. M. Jardine, 78-87.
- FARMER'S FOREIGN MARKET, THE.** Robert J. McFall, 129-55.
- FARM INCOME SITUATION, THE.** Robert J. McFall, 1-21.
- Farm: business, organization of,** 78-81; conditions, reorganization work, 202; labor, 79; improvements, need for, 85; need for governmental help and research on, 84; operators: shifting among, 53; income rates of, 30; operation, improved methods of, 81-4; problems, 63; products, 250; expansion of, 243; relative exchange position of, 23-5; standardize, need to, 237; tenants, number of, 61.
- Farmer, better conditions for,** 94; difficulties of price fixing and supply, 253; disposal of foreign

- surplus on, 167; earnings of, 31; income, margin of over fixed charges, 35; indictments against organizations of, 228; profits to, through co-operation, 209-12; tenant and owner, 62.
- Farming, diversities of, 258-60; major risks in, 95-8.
- Federal, Farm Loan Act, 72-6; Land Banks, difficulties of, 74; Reserve Banks, operation of, during deflation, 70-2; Reserve System, creation and working of, 69, 70.
- FERTILIZER USE IN THE UNITED STATES. Sidney B. Haskell, 265-70.
- Fertilizer, profit from use of, 268; use of, 265.
- FINANCIAL GAINS OF MARKETING SUCCESSFULLY THROUGH CO-OPERATION. Theodore Macklin, 208-16.
- Financial condition, Central Europe, 161.
- FITTING PRODUCTION TO THE MARKET. Robert J. McFall, 248-54.
- Foodstuffs, exportation, decline in, 48.
- Foreign exchange, influence of on export market, 152; trade, U. S. trend of, 129.
- Frost insurance, 109.
- Fruit crop insurance, 106.
- GENUNG, A. B. The Purchasing Power of the Farmer's Dollar from 1913 to Date, 22-6.
- Grain: elevators, fluctuations in costs, 188; in margins, 190; variations in costs, 185-8; production, expansion possibilities, 160.
- GRAVES, L. M. Interest and Taxes in Relation to Farm Income, 35-40.
- GRAY, L. C. A Domestic Market for American Farm Products, 156-65.
- Hail insurance, 110-12.
- Hartford Fire Insurance Company, crop policy of, 102; 117.
- HASKELL, SIDNEY B. Fertilizer Use in the United States, 265-70.
- HEDDEN, WALTER P. Measuring the Spread from Farmer to Consumer, 177-83.
- HIBBARD, BENJAMIN H. The Extent of Co-operative Marketing Among Farmers Today and the Results Secured by Co-operative Associations, 201-7.
- HOFFMAN, G. WRIGHT. Crop Insurance—Its Recent Accomplishments and Its Possibilities, 94-120.
- Hog products, 149.
- HOLMAN, CHARLES W. The American Farmer and the Tariff, 166-76.
- INTEREST AND TAXES IN RELATION TO FARM INCOME. L. M. Graves, 35-40.
- INCOME FROM AGRICULTURAL PRODUCTION. L. H. Bean and O. C. Stine, 27-34.
- Income: (gross) agricultural, 33; farm, 2; personal, farm, 4.
- Indebtedness, farm, decrease in personal, 39.
- Industry, failure of, to increase output, 267.
- Insect pests, control of, 82.
- Insurance, agricultural, kinds of, 95; measuring risks in, 112-20.
- Intermediate Credit Banks, 76.
- Inter-relationship of marketing units, 192-4.
- Interstate Milk Producers' Association, growth of, 236.
- JARDINE, W. M. Farmers as Managers, 78-87.
- JOHNSON, GEORGE F. The Place of Advertising in American Agriculture, 255-7.
- Joint, Commission of Agricultural Inquiry, 1921, study of, 195; Stock Land Banks, legal status of, 75.
- King, Clyde L., work of (Governors' Milk Commission) 233-5.
- King, Dr. W. I., estimates of, 28, 31.
- Land: farm, subletting, leasing, owning, 78; values, trend in, 45-9.
- Livestock improvements, 83.
- LOOMIS, A. M. The Trend in Tenancy and Ownership, 61-8.
- MACKLIN, THEODORE. Financial Gains of Marketing Successfully Through Co-operation, 208-16.
- Malnutrition, 274.
- Margins: comparative, 283; distribution, reasons for variance in, 178; studies in, 177, 182; gross, means of computing, 179.
- MARKETING FLUID MILK IN PHILADELPHIA—AN EXPERIENCE IN SALES CO-OPERATION. R. W. Balderston, 231-42. Markets, advantage of nearby, 279; agricultural, collapse of price levels in, 157; demands of home, 251; foreign and domestic expansion, 122, 250; foreign grain exports, 145; from foreign to domestic, 48; present foreign, 131; U. S. chief, 154; methods of, 281.
- MCCOLLUM, E. V. Scientific Nutrition and the Farm Output, 271-7.
- McFALL, ROBERT J. The Farmer's Foreign Market, 129-55; The Farm Income Situation, 1-21; Fitting Production to the Market, 248-54.
- McKEE, JOHN M. The Relation of Local Farm Output to the Local Product, 278-84.
- MEASURING THE SPREAD FROM FARMER TO CONSUMER. Walter P. Hedden, 177-83.
- Meat consumption, 252.
- MIGRATION TO AND FROM OUR FARMS. Charles L. Stewart, 52-60.
- Migrations, annual (farm) 53-5; permanent, 55; seasonal, of farm operators and laborers, 52; to city, causes of, 57-9.

- Milk, importance of, 231; Commission, Governors' Tri-State, 233; prices, factors in arranging, 235; *Philadelphia*, information regarding, from survey, 256; selling plan of, in, 237.
- MILLER, JOHN D. Sound Principles in Co-operative Legislation, 227-30.
- Mortgages, farm, former system of, 73; indebtedness, 35-38.
- NATIONAL AGRICULTURAL PROGRAM, A. Henry C. Wallace, 124-8.
- National wealth and agricultural income, 27.
- Newborn animals, loss of, 275.
- Nutrition, science of, 271.
- Osteomalacia, prevalence and causes of, 273.
- Percentage, farm rented homes, 62.
- Philadelphia Interstate Dairy Council, work of, 239.
- PLACE OF ADVERTISING IN AMERICAN AGRICULTURE, THE. George F. Johnson, 255-7.
- Population, farm, proportion of children on, 59; growth of, 45; ratio of, to food production, 249.
- POSSIBILITIES AND LIMITATIONS OF CO-OPERATIVE MARKETING. H. E. Erdman, 217-26.
- PRICE, H. BRUCE and JOHN D. BLACK. Costs and Margins in Marketing, 184-200.
- Products, cost of farm, 7-14; livestock, etc., 291; total value of, farm, 14-21.
- Prosperity, European, 137.
- Proteins, necessary supply of, 271.
- PURCHASING POWER OF THE FARMER'S DOLLAR FROM 1913 TO DATE, THE. A. B. Genung, 22-6.
- Railroad expansion, influence of, on land values, 45.
- Readjustment period, in agriculture, 158.
- Realty Revenue Guaranty Company, Minneapolis, 99.
- RELATION OF LOCAL FARM OUTPUT TO THE LOCAL PRODUCT, THE. John M. McKee, 278-84.
- Rural communities, activities in, 89.
- Sales policies, improved, farm, 83.
- SCIENTIFIC NUTRITION AND THE FARM OUTPUT. E. V. McCollum, 271-7.
- SERVICES OF AMERICAN AGRICULTURAL COLLEGES, THE. A. C. True, 88-93.
- Smith-Lever Extension Act, 88.
- SOUND PRINCIPLES IN CO-OPERATIVE LEGISLATION. John D. Miller, 227-30.
- SPILLMAN, W. J. Balanced Agricultural Output in the United States, A, 285-92.
- Statistical service for farmers, need of, 290.
- Sterility, among dairy cows and bulls, reasons for, 274.
- STEWART, CHARLES L. Migration to and From Our Farms, 52-60.
- STINE, O. C. and L. H. BEAN. Income from Agricultural Production, 27-34.
- Strong, Benjamin, testimony of, 72.
- SUPPLY AND PRICE INTERACTIONS IN FARM AND CITY PRODUCTS. H. A. Wallace, 43-7.
- Surveys, information from, 256.
- Tariff: Act, emergency, for farm protection, 167; early conflicts, 166; farmer's interest in and reason for, 168-71; Fordney Bill, 171; flexible provision of, 172-4; McNary-Haugen Bill, 176; present Commission and weaknesses, 174.
- TAXES IN RELATION TO EARNINGS OF FARM REAL ESTATE. C. O. Brannen, 41-4.
- Tax situation, defects in, 42-4.
- Taxation, effect of on industry, 41.
- Tenancy, effect of on living standards, 63.
- TREND IN LAND VALUES AND LAND UTILIZATION, THE. George S. Wehrwein, 45-51.
- TREND IN TENANCY AND OWNERSHIP, THE. A. M. Loomis, 61-8.
- TRUE, A. C. The Services of American Agricultural Colleges, 88-93.
- U. S. Senate, resolution of, recrop insurance, 94.
- Vitamins, nutritive value of, 272.
- WALLACE, H. A. Supply and Price Interactions in Farm and City Products, 43-7.
- WALLACE, HENRY C. A National Agricultural Program, 124-8.
- War: demand upon crops, 157; results of, on agriculture, 134; Finance Corporation, activities of, 69.
- WEHRWEIN, GEORGE S. The Trend in Land Values and Land Utilization, 45-51.
- WELTON, A. D. Agricultural Credit Facilities—Are They Ample? 69-77.
- Wheat: factor in farm recovery, 263; situation in, 289; tariff on, 176; undertakings in crop insurance of, 99-106.
- Women, farm, help given, 90.
- Wool, etc., developing, 287.

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